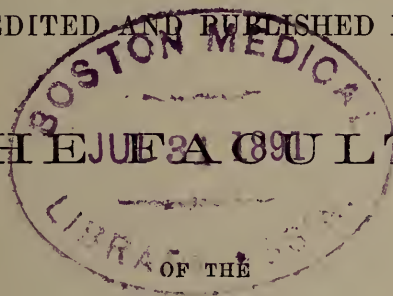


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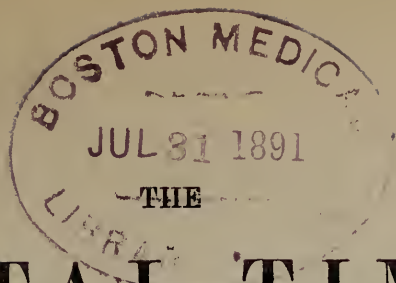
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DENTAL TIMES.

VOL. VI.

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No. 1.

Original.

IMPORTANT POINTS IN FILLING.

BY JAMES TRUMAN, D. D. S.

It is a notorious fact, and one certainly discreditable to us as a profession, that so many failures are constantly being made in filling teeth. It must be evident, to every careful observer, that this proceeds either from a lack of ability to perform this important operation, or a proper comprehension of what is required to render our fillings really as permanent as the tooth structure in which they are imbedded. There is no valid excuse for the constant dropping out of fillings, unless from absolute fracture of the tooth itself, and any dentist that has this experience constantly occurring in his hands, should seriously ask himself the question, whether he has not mistaken his calling, or, at least, in need of better instruction than at present possessed. The carelessness, so constantly met with in these operations, is disgraceful in a purely mechanical point of view, to say nothing of the absolute dishonesty of the transaction. Too much leniency has, in the past, been shown in this respect, and by far too many have screened themselves behind the well-understood fact that conditions are not favorable for equally good work in all cases. This apology, if it may be dignified by that name, holds good for the fewest number of cases, and should be the rare exception instead of the rule. It is doubtless true, that patients are occasionally met with for whom it is impossible to do really good work; but even here fillings can be made that will serve the purpose intended, always making due allowance for subsequent effects from abnormal secretions of the mouth.

What, then, are the important points to be attended to to attain the permanency desired? We must have

- 1st. Thorough anchorage.
- 2d. Absolute solidity in every part of the cavity.
- 3d. Thorough polishing of all edges of cavities, both before and after filling, and of the material used.

A preliminary step is to attend to the quality of the material. If gold, it must be of sufficient adhesiveness to cohere without any great effort. In my judgment, no filling can be perfectly placed in a cavity in which the operator ignores this quality in gold or tin. In this, I am aware, I am in conflict with many whose judgment is always to be received with respect. To my mind, any other mode of filling teeth is eminently unphilosophical, and cannot reach the perfection of those made on the cohesive or adhesive principle. Therefore, if the gold fails to possess this quality, it should be laid aside as unfit for use.

What is meant by anchorages? In answering the question, I am well aware of the difficulty of describing clearly my meaning by words, an operation that needs the sense of touch, as well as sight, to comprehend. All operators will probably assert that they are careful to prepare the cavity to retain the filling, but what do they mean by this? Certainly not such as some others understand, if we may judge by results. It should be held as an axiom, in filling teeth, that *the first portion of gold should be so firmly placed that any ordinary force will be unable to dislodge it*. With the importance of this admitted, it follows, as a natural sequence, that the anchorages should be of such a character to accomplish it in the best manner. If the above rule be strictly adhered to, it also follows, as a natural certainty, that with a sufficient number of these keys in a cavity, that ultimate dislodgement of the filling must be absolutely impossible, with ordinary care being taken in the subsequent packing of the metal.

Let us, for example, take an approximal cavity on an incisor tooth. Suppose we excavate this at the neck, in such a manner that we have scooped out small depressions at either approximal angle of the cavity, and another similar depression made at the cutting edge. Now the whole of this cavity may be larger internally than at the orifice; but can it be considered properly anchored? A fracture at any point along the edges may serve to dislodge the whole of it. Again, the difficulty of producing a perfect operation at the cervical wall is rendered doubly doubtful, while the constant danger of that portion of the filling being dislodged is a constant source of anxiety to the operator. A filling, placed in under such conditions, may prove a good one, but this result is accomplished more by the character of the tooth tissue than by any correct mechanical applications to the work.

It is not to be supposed that any one will contend that mere solidity will answer to retain a filling. To accomplish this retention in the cavity, the most effectual means must be adopted. In the cavity under consideration, it is not always possible to do better than this; but, as a rule, much more effective anchorages can be made.

The plan now adopted, by those careful in this particular, is to secure, by drill, a tubular perforation somewhere, sufficiently distant from the pulp, that, when filled, it will form a solid bolt of metal. The only places that these can be made, in the cavity under consideration, are in that portion of the dentine near the labial surface at its junction with the cemental border, and, in the same position, in the palatine surface. If the drill be passed steadily up in a line with the long axis of the root, a tubular opening can be made of one-sixteenth of an inch in depth, or even less, that will answer every purpose intended.

The drill for this object should be made very small and square-edged, similar in shape to an ordinary carpenter's chisel. Those made pointed or spear-shape are not suited to this work, the point leaving the upper part of the tube the worst form possible to retain the bolt or retaining key.

Now, all that is necessary, after packing the metal solidly in these tubes, is to build it compactly from one to the other, thus forming a base that cannot be moved with any force necessary subsequently to apply to it, providing proper attention has been paid to the exclusion of moisture.

All cavities, wherever situated, require similar treatment, always bearing in mind to form as many of these tubes as the nature of the cavity will admit of, without endangering the strength of the tooth; this precaution should never be overlooked. In approximal cavities of bicuspid teeth, the retaining tubes must be thoroughly made, two at the cervical wall, two undercuttings at the cusps, and, generally, one in the centre of the cavity between the cusps. But, let the cavity be situated where it may, or let it be ever so much barrel-shaped, a single tubular opening cut in at any portion, will greatly facilitate the filling.

The next point to be considered is absolute solidity throughout. Is this always attained? I think not; perhaps, never so by any of us. But the nearest approach to perfection in this respect, will render our work proportionably perfect. Where it is attained, the metal will be closely compacted against the walls of the cavity. The use of adhesive foil has produced many disappointments and led many to abandon it from a want of proper care at this portion of the cavity. If the foil be rolled tightly in a rope, and then cut into pellets, the tendency will necessarily be to clog or bridge over spaces. The foil will not reach the wall, and all the force that may be brought to bear against it, will avail nothing to bring it to proper position. This is well demonstrated in approximal cavities of incisor teeth, where but a thin, nearly transparent film of enamel exists. In such cases, the gold, if properly packed, should show through the thin tissue. If it fails to exhibit itself, it has not reached the wall, and it, therefore, requires no gift of prophecy to foretell the ultimate discoloration and destruction of the filling.

The gold to be used along this wall should, if adhesive, scarcely be folded at all. Sufficient softness must be retained to mould readily into all slight depressions as the force is applied. No filling, however good in all the respects named, will effectually preserve the tooth, unless thoroughly finished, and not only the metal but the edges or walls of the cavity. They should be polished with the various appliances used for this purpose, until there is an absolute consciousness in the operator's mind that no unevenness exists to serve as a lodgment for the constituents of the saliva. Could every dentist study, for a few moments, under the microscope, the surface of a filling that has been polished to the utmost out of the mouth, the lesson would be an instructive one. If freedom from scratches be impossible, with the care thus given a surface, what must be the condition of most fillings, left as they are, with but little of this attention? The wonder is, not that a few here and there fail, but that all are not fore-doomed to destruction.

The scope of this article does not include filling teeth in detail, with the many additional important matters to be attended to. The object has been attained if I have succeeded in calling attention of some of the younger members of the profession to these important preliminary considerations. Primary, above all, then, I have placed anchorages. It is the failure to perfectly accomplish this, that renders the majority of operators so timid in filling teeth in the presence of others. There can be no confidence in ultimate success, without a thoroughly anchored base to build upon.

PROTOXIDE OF NITROGEN AS AN ANÆSTHETIC.

BY GEORGE T. BARKER, D. D. S.

From the *Medical Times and Gazette*, London, April 18th, 1868, we extract the following article:—

“*Protoxide of Nitrogen as an Anæsthetic.*—Much interest has recently been excited in London by the introduction of protoxide of nitrogen as an anæsthetic agent, which has for the most part been due to the efforts of Dr. Thomas Evans, of Paris, who has recently made a visit to the metropolis for the express purpose of enlisting popular opinion on its behalf. We have hitherto abstained from saying anything on the subject, as the minds of the medical public might not be prepared to receive a perfectly unbiassed but somewhat adverse estimate of the value of the gas as an anæsthetic, but we now consider it our duty to lay certain facts before them which will tend to put matters in a true light. In the first place, then, the use of nitrous oxide as an anæsthetic is not a new discovery. When, owing to the brilliant series of discoveries made by Davy and others, pneumatic chemistry was in its greatest glory, the treatment of disease by the inhalation of different gases was a favorite scheme. Davy discovered the peculiar exhilarating effects of nitrous oxide, and the notion of using it as an anæsthetic was straightway formed. Again and

again it was tried in this way at home and abroad, but repeated trials only seemed to render its inapplicability more decided, and we have heard little of it until news of its resuscitation, chiefly in dental practice, reached us from America. The success of the new attempt seemed to depend on the fact that no air was inhaled along with the gas, and that thus its peculiar stimulating effects were in great measure prevented. Preparatory, however, to entering on a discussion as to the special merits and demerits of protoxide of nitrogen as an anæsthetic, a few words on its chemical history may not be out of place.

“Nitrous oxide, then, or protoxide of nitrogen, (N_2O) is a gas having exactly the same specific gravity as carbonic anhydride (carbonic acid CO_2)—1.52—and of course the same relative weight. It may be prepared in a variety of ways—cheaply by the action of zinc on nitric acid, strengthened by sulphuric acid; more expensively, but in a purer form, by heating the nitrate of ammonia, although even in this way the gas may be contaminated by the presence of other oxygen compounds of nitrogen, or by chlorine compounds resulting from inequalities of temperature during the process of preparation or impurities in the salt. Its taste is pleasantly sweetish, and its chemical properties are almost identical, although somewhat lower in degree, with those of oxygen. One notable exception is its solubility in cold water, which is much greater than that of oxygen, for hot water does not take up so much of the gas as that at a low temperature. These facts are necessary to a true understanding of its effects.

“To prepare protoxide of nitrogen for inhalation, then, great care must be taken to preserve its purity; consequently it becomes important to maintain, as nearly as possible, an equal temperature during the process of its manufacture, and, should any nitric oxide to be formed, to deoxidize or remove it, which is best done by a solution of ferrous sulphate, (sulphate of the protoxide of iron,) and washing in water. From what we have said, this washing in water, and keeping the gas for any length of time over water, must be attended with great loss, as much of the gas is thereby absorbed. This may be, to a great extent, avoided by employing water at an elevated temperature, or a strong solution of common salt for the same purpose. When about to be inhaled as an anæsthetic, great care must be taken that no oxygen or air become mixed with the protoxide; otherwise the peculiar effects described by Sir Humphry Davy are observed instead of anæsthesia.

“Let us now consider how the gas produces anæsthesia. And here we must confess our indebtedness to some most admirable remarks made at the Medical Society of London, on Monday night, by Dr. Richardson. When protoxide of nitrogen is inhaled instead of air, there are no longer two gases of very different densities on either side of the pulmonary capillaries, the one in the air-cells of the lung, the other in the blood. Consequently, seeing that nitrous oxide and carbonic acid, having the same density and the same diffusibility, will not change places,* carbonic acid will become accumulated in the system to an enormous extent. The small amount of protoxide of nitrogen absorbed, having chemical properties

*[The writer of this article has entirely misunderstood Dr. Richardson's statement. Dr. R. remarked “that as gases of the same density diffused equally, carbonic acid gas would diffuse into nitrous oxide at the same rate as it would diffuse into itself. The density of the two gases being equal, diffusion would be equal.” There are, however, other circumstances to be taken into consideration, which we have not now time to discuss.—ED. MED. NEWS.]

almost identical with those of oxygen, will, we may suppose—although on this point opinions are divided—hasten the production of carbonic acid, and, consequently, its accumulation. No wonder, then, that anæsthesia, or rather apnœa, rapidly follows. It cannot be too widely understood that protoxide of nitrogen is not *an anæsthetic* in the true sense of the word, but an *asphyxiating agent*; *that its effects are identical with those of poisoning by carbonic acid gas*. The physical properties of protoxide of nitrogen are those of carbonic acid; its chemical, those of oxygen: and hence it is that it produces anæsthesia. Many men are apt to found their conceptions of poisoning by carbonic acid on the descriptions given of death caused by the fumes of burning charcoal. This is an error. The poisonous agent produced by burning charcoal is really carbonic oxide; the effects observed are characteristic of this gas, and differ essentially from those of carbonic acid. Death from carbonic acid may occur as from the choke damp of coal mines, or the after damp which follows an explosion of fire-damp; or, as has sometimes happened, by men entering brewers' vats before they had been properly ventilated. Thus death may occur as speedily as it does when any small animal is made to inhale protoxide of nitrogen; for that death does so result, has been unmistakably proved by Drs. Richardson and Ludimar Herman, (see Reichert and Du Bois' *Archiv* for 1864, pp. 521, *et. seq.*) the great workers on the subject. Were an animal made to inhale pure hydrogen or nitrogen gas, capable of no vitalizing action on the blood, the same results would follow, but in a longer time; for the densities of the gases being smaller than that of carbonic acid, the latter would diffuse outwards but no oxygen would pass inwards, and consequently the vital processes must ultimately be arrested.

“These facts serve to explain the intense lividity of the face of a patient under the influence of nitrous oxide, the dark color of the blood which flows from any wound made by the surgeon, the slow pulsation and almost complete arrest of the heart's action, as well as the speedy recovery when the gas is no longer inhaled; for, owing to the great quantity of carbonic acid in the blood, it will tend to diffuse rapidly outwards. Hence, also, the great danger of giving protoxide of nitrogen to a patient who has diseased lungs, either the result of pulmonary or cardiac affection, as the intense congestion produced by the gas may give rise to severe subsequent hemorrhage. It will also be seen that the gas cannot be administered to every individual to the production of anæsthesia without great risk of inducing fatal apnœa. This fact will ever be a great bar to its general employment. Nevertheless, Marion Sims speaks of operating on a patient under its influence when the operation lasted twenty minutes. We can scarcely understand how this could have been, except the mouth-piece of the inhaler had been repeatedly withdrawn during that period. If nitrous oxide is to take its place as a regular anæsthetic, it must be, for the most part, in operations of short duration, as in dentistry, and some branches of ophthalmic surgery. Some of our leading men in these departments already speak highly of it, especially as being followed by no evil subsequent effects, but our experience is hardly so extended as to lead us to accept it without hesitation. For certain surgical operations, where complete muscular relaxation is indispensable, nitrous oxide is valueless, and will never take the place of chloroform.

“We have made these observations in a calm and temperate spirit. We are very far from being opposed to the introduction of anything likely to

benefit our fellow men, but we have considered it our duty to lay before them the true action of protoxide of nitrogen, that, should they be inclined to adopt it, they may not do so with ignorant rashness. It is an edged tool not to be wantonly tampered with."

It is an unfortunate fact that the author of the above has ventured to give an *opinion* on a subject with which he is evidently but slightly acquainted, as the whole article gives proof of but limited experiment with the agent. I propose briefly to consider some of the objections urged, and present in refutation the result of my own investigation of the subject.

He says: "To prepare protoxide of nitrogen for inhalation, then, great care must be taken to preserve its purity; consequently it becomes important to maintain, as nearly as possible, an equal temperature during the process of its manufacture, and should any nitric oxide be formed, to deoxidize or remove it." While it is certainly the most desirable to decompose the salt at as low and uniform a temperature as possible, I am satisfied that the danger of forming any poisonous gas, as nitric oxide, is entirely imaginary. Nitrate of ammonia, if heated much above 400° F., does not entirely decompose into nitrous oxide and water, but a portion is volatilized in a globular form, as nitrate of ammonia, into the receiver, where it is dissolved by the water. This is easily tested by taking equal quantities of the salt, and heating one part to 400° F., and the other to 600° F. It will be found that the quantity of gas in the receiver will be much greater than is obtained from the decomposed salt at a low temperature. When nitrous oxide was introduced to general use as an anæsthetic, (1862,) much of the nitrate of ammonia was impure, containing chlorine, which was derived from impure nitric acid used in the manufacture of the salt; but that difficulty is now removed, as the demand for a pure salt has been met, as I have made careful experiments with several varieties, and *all* were free from chlorine, though most of them were not quite neutral, as they contained a little free nitric acid, which is allowed by manufacturers to remain, as it gives the salt a clearer, whiter appearance; but as nitric acid is readily taken up by the water in the receiver, it can certainly be no serious objection.

On this subject the author learnedly remarks: It may be prepared in a variety of ways; "more expensively, but in a purer form, by heating the nitrate of ammonia, although even in this way the gas may be contaminated by the presence of other oxygen compounds of nitrogen, or by *chlorine compounds resulting from irregularities of temperature during the process of preparation*, or impurities in the salt." That chlorine may be obtained from impure salt, is evident; but that any irregularities of temperature may produce it from pure salt, is preposterous.

"From what we have said, this washing in water and keeping the gas

for any length of time over water, must be attended with great loss, as much of the gas is thereby absorbed." A small portion of the gas is lost by keeping it over water; but the quantity is much less than is usually supposed. In a receiver holding about forty gallons of gas to the same quantity of water, the loss will be about half a gallon daily, the absorption of gas by the water being very gradual; but gas that has stood for several days is quite equal in its anæsthetic properties to that freshly prepared.

"When about to be inhaled as an anæsthetic, great care must be taken that no oxygen or air become mixed with the protoxide, otherwise the peculiar effects described by Sir Humphry Davy are observed instead of anæsthesia." There is no difficulty in excluding atmospheric air with properly arranged flexible mouth-pieces, or, indeed, by the aid of a careful assistant to hold the nostrils; and as all investigation goes to prove (see Snow on Anæsthetics) that surgeons do not allow patients, as a general rule, a sufficiency of atmospheric air with other anæsthetics, it may be presumed that they will not be unapt scholars in the use of nitrous oxide.

On the subject of how nitrous oxide produces anæsthesia, we entirely differ with the author in his conclusions, though agreeing with him in some of his statements; but as its *modus operandi* must be a subject of speculation, we will leave that part of the subject, and refer to the following: "These facts serve to explain the intense lividity of the face of a patient under the influence of nitrous oxide, the dark color of the blood which flows from any wound made by the surgeon, the slow pulsation and almost complete arrest of the heart's action, as well as the speedy recovery when the gas is no longer inhaled; for, owing to the great quantity of carbonic acid in the blood, it will tend to diffuse rapidly outwards." If the symptoms described were the ordinary ones of anæsthesia from nitrous oxide, instead of exceptional ones, I should as seriously object to its introduction and use as the author; but the facts are, that when pure gas is inhaled through a mouth-piece so arranged that the expirations of the patient pass into the atmosphere, while the inspirations are only of pure gas, the symptoms are entirely opposite; there is, instead of lividity of the face, first, a slight blanching of the countenance, followed by increased redness, evidencing active capillary circulation. There is usually about the same change in the pulse as occurs from the use of ether; first increased activity, followed by moderate depression of force and rapidity of heart's action. The color of the blood is not changed as stated. The symptoms described are seen, we admit, when nitrous oxide is administered from a small bag, and the patient is compelled to re-inhale his own deteriorated exhalations; but not when properly exhibited. Nitrous oxide, like oxygen, increases the activity of the vital functions,

and, as a result, carbonic acid is given off in the exhalations in great quantity; hence it is that no careful operator should make use of such a mode of administration. In this country the advocates of this method are principally charlatans, whose field of operations, we see, now embrace both England and France.

The author again remarks: "It will also be seen that the gas cannot be administered to every individual to the production of anæsthesia, without great risk of inducing fatal apnœa. This fact will ever be a bar to its general employment." As the same remark might with justice be made of every anæsthetic, it requires but a simple reference to prove its unjustness. If the therapist was obliged to use only remedies that could be administered with safety to every one, we judge the list of remedies would be greatly lessened. Nitrous oxide, like every other anæsthetic, requires from the operator both judgment and discretion. Unfortunately both the medical and dental public have re-echoed the standing advertisements of the ——— Dental Association, that nitrous oxide could be given "in all sorts and stages of disease," when in truth it requires as much care in its use as other anæsthetics. In the appropriate language of the author of the quoted article, "It is an edged tool not to be wantonly tampered with."

We shall close this review with a reference to the following: "Marion Sims speaks of operating on a patient under its influence when the operation lasted twenty minutes. We can scarcely understand how this could have been, except the mouth-piece of the inhaler had been repeatedly withdrawn during that period. If nitrous oxide is to take its place as a regular anæsthetic, it must be, for the most part, in operations of short duration, as in dentistry and some branches of ophthalmic surgery. Some of our leading men in these departments already speak highly of it, especially as being followed by no evil subsequent effects; but our experience is hardly so extended as to lead us to accept it without hesitation. For certain surgical operations, where complete muscular relaxation is indispensable, nitrous oxide is valueless, and will never take the place of chloroform." Which is, to say the least, considering the author's experience is not extended, which he admits, a very broad assertion. In reply to its use in surgery, I would remark that nitrous oxide has been used in major operations in this country with excellent success, and it seems well adapted for protracted operations, as there is no subsequent depression, which usually follows the use of either ether or chloroform. But the chief advantages resulting from the use of the protoxide have not been stated by the author, and they consist in the rapidity with which anæsthesia is induced and consciousness is restored, without subsequent sedation. Blood, surcharged with chloroform, will, in many instances, in spite

of every effort on the part of the surgeon, induce death of the patient. With ether there is the same danger, though not to the same extent; but in this respect nitrous oxide is devoid of danger, as it is rapidly eliminated from the system, consciousness returning in a few moments. With no desire, except that the agent should be fairly tested, we leave the subject.

THE RUBBER SUITS IN PHILADELPHIA.

BY T. L. BUCKINGHAM, D. D. S.

It is not my intention to enter into a lengthy argument on the legality of the hard rubber patents, or even to give an account of the several suits that have been brought against the dentists; but I only intend, in the present paper, to state how the case has been managed here in Philadelphia.

We, like the dentists in other sections of the country, were visited occasionally by itinerant agents, or, at least, by those who pretended to be agents for the Hard Rubber Company, for several years before the patent was extended, and some rights were sold. But I know of no case where legal proceedings were ever commenced to compel any one to cease using it, nor was a regular demand made on us until the Association met at Boston, and the committee there appointed had fixed a rate of royalty to be paid. Shortly after this an agent began regularly to canvass our city, demanding a settlement for all cases from May, 1865, up to that time, and an agreement to pay the royalty in future. Some few of the weak-kneed ones, (who afterward proved to be the wisest,) acceded to this demand, but the majority refused to settle on any terms. Things continued in this state until November, 1866, when three or four of the dentists were notified to appear at court, and show cause why an injunction should not be issued against them.

This looked like going to work in earnest, and the dentists called a meeting to consult on the case. After several meetings, an association was formed, the object of which was to collect funds, employ counsel, and defend any suit that might be brought against the members. When this organization was about completed, some parties stated that they had been consulting with a number of dentists who were willing and ready to contribute to a fund to defend a suit, but were unwilling to join an association for that purpose, and a proposition was made that the association be disbanded and a committee appointed to carry out its intentions. This proposition, after some warm discussion, was agreed to. This committee met, appointed its chairman and other officers, and commenced collecting funds to carry out its object, with the understanding that they would defend any one who subscribed to the fund, until at least one case had

been decided by the court. They collected about eleven hundred dollars, and employed a lawyer, whom they paid five hundred dollars, and an assistant who also received the same amount. The lawyer or the assistant, I do not know which—it probably took both—wrote out an answer and had it printed, leaving blanks so that it would answer for all cases that might come up, which was handed into court in reply to the cases then commenced.

The Company's counsel did not, for some reason, push these cases to trial, but let the matter rest until last January, (1868,) when several new suits were commenced against other parties, and, unfortunately, I happened to be one of them; so that from this time on I can speak from personal experience. I called upon the chairman, and, after talking the case over with him, I requested a note to the lawyer, with whom I had several interviews, and went into court with him on the day the cases were to be called up. While there, the Judge stated that he could not hear the case then, but would set some future day for it. At this time the lawyer intimated to me that he expected to have another fee, as these were new cases, and that he had only been employed to defend the first cases. I told him I did not come to ask him to defend my case alone; I only represented the dentists, and supposed he was engaged to defend one case at least through the court. I afterward reported to the chairman of the committee what the lawyer had intimated to me; he advised me to leave the case in his hands, and he would attend to it. I acted according to his advice, and heard nothing more of my case until near the first of May, when I learned an agent was calling on the dentists and showing them a copy of an injunction he said they had obtained against me. I called upon the chairman of the committee; he said he knew nothing about it; he supposed the lawyer had attended to it, and, when the lawyer was asked about the case, he stated, very coolly, that he had paid no attention to it, as he had not been employed for these new cases; and so, between the two, very little satisfaction could be obtained, and the only advice I received was, "You had better settle with the Hard Rubber Company." I took this last advice, and must say that I was treated better by the agent of the Company than by our own lawyer, paid the royalty on work done since 1865, the costs on the injunction, and for a license for the present year.

Since my case has been decided, I have almost daily received letters making inquiries about it, and asking advice. I have not time to answer all these letters in full, and therefore publish this short history, so that those who are interested may know how the case has been managed and its termination.

BLEACHING TEETH.

BY JAMES TRUMAN, D. D. S.

Having received many inquiries, by letter and otherwise, in regard to the method of bleaching discolored teeth, adopted by myself several years ago, it seems necessary to repeat, in substance, the paper, on this subject, published in second number, Vol. 2, of the DENTAL TIMES, of 1864. Since that appeared in print, the opportunities of further testing this mode have been considerably extended, and of that varied character that enables me to speak more positively in regard to its value. Time has not only confirmed the correctness of the positions then taken, but has also demonstrated more clearly what may and what cannot be accomplished with it. That the bleaching of teeth will ever become a popular branch of practice, no one, at all conversant with the tediousness of the necessary manipulations, will, for a moment, undertake to assert. But, as an essential part of our duties, it cannot be neglected, or slurred over as one of the operations that never pay.

The process is based on the fact of the bleaching properties of chlorine, and that an acid brought in connection with chloride of lime, in the cavity of a tooth, will liberate sufficient of that gas to produce the bleaching effect desired. It is the same process, in daily use, in bleaching fabrics for wear in the manufactories devoted to this object, hence is nothing new. Neither is the use of chloride of lime in the tooth for this purpose, for this also has been used, with little or no success, from a very early period in dentistry. The adoption of an acid, in connection with the chloride of lime, has been of but recent introduction, and until the afore-mentioned article appeared, there had been no really effective plan of bringing chlorine gas in immediate contact with the discolored matter in the tubes of the teeth.

In some recent discussions that have taken place in the Society of Dental Surgeons, New York City, I find this process has been experimented upon with partial success. The bleaching of the tooth was accomplished to entire satisfaction, but then there had been also a partial failure, owing to a recurrence of the discoloration. This, I think, must be attributed to another cause, the attempted explanation of which, comes more properly after the means taken to effect the object have been explained.

The preliminary treatment of the tooth, prior to attempting to bleach, must be as thorough as the case demands. The pulp is necessarily dead. If periosteal inflammation be present, the tooth must be properly treated, and brought to a healthy condition. The root or roots be thoroughly cleansed of all decomposed particles, and then filled solidly with gold to *not more than half the length of the canal*. This filling must be as solid as

it is possible to compact the particles together. This part of the operation is of very great importance, for it must be remembered that chlorine is exceedingly irritating, and in teeth of this character all irritating agents brought in contact with the peridental membrane, may produce a complication of difficulties, troublesome, if not impossible to overcome. The object in filling only half the length of the canal is to permit the full bleaching effect to take place on that portion of the tissue above the open mouths of the tubes radiating from the pulp chamber through the crown.

Having accomplished the preliminary steps thus far, the application of the agent may be proceeded with. The plan, formerly adopted, was to use dilute acetic acid, in connection with the chlorinated lime. But I now use it of the ordinary strength. The mode of introducing into the cavity is not of much importance. It may very conveniently be placed in position, by first saturating a pledget of cotton with the acid, dipping that in the lime, placing it in the cavity, and immediately sealing it up. The mode now used is to place the chloride of lime in the cavity, then cover with the cotton, saturated with the acid, and then with the temporary stopping. The advantage of this consists in that but slight loss of gas is experienced, and much of the irritation to the mouth and throat avoided.

Various means have been adopted to seal up the cavity, with different degrees of success. The least valuable, perhaps, is that ordinarily used for temporary stoppings—sandarach varnish. Indeed, in my hands, the full effect of bleaching seems to be lost by its use. Wax and cotton combined, serves a very excellent purpose in some cavities; in others, it has been found necessary to close with Hill's stopping, or, what is better, oxy-chloride of zinc. The application should be changed two or three times a week, until the effect is produced. After each application has been removed, the cavity should be carefully scraped with the excavator, and well rinsed, to free it from all loose particles. Care must be taken to open out the whole of the pulp chamber, a precaution that is, without doubt, too often neglected in teeth where the pulp canal requires treatment.

The rapidity of the bleaching process will depend mainly on the quality of the chloride of lime used—which must be good—and also upon the character of the tooth to be bleached. Experience leads me to the opinion that where the peridental membrane has, to some extent, lost its vitality, the operation will proceed with much less rapidity, and the results will not be as satisfactory. Whether this opinion will be confirmed by future observations or not, it must, I think, be conceded, that the greater the amount of vitality existing in the tooth, will be the proportionate rapidity

of the process. In teeth in which consolidation of the dentinal tubes with the intertubular tissue has taken place, obliterating the former, there must necessarily be failure as a resultant. But as this condition, throughout the entire dental tissue cannot occur, without the loss of the tooth, cases of entire failure from this cause may be considered impossible.

The objection to bleaching teeth—that the color will return—has been several times urged as a reason for not attempting this treatment. The cause of this may possibly be found in the failure to leave sufficient of the canal open. Closing this portion down to the pulp chamber, would necessarily involve the danger of the passage of discolored fluid through the tubes to the crown. Whether this be the true explanation or not, it is certainly true, that with this precaution invariably taken, I have not found a single case, that has come under my care, in which a recurrence of color has taken place. An examination recently of a lateral incisor, bleached more than two years ago, illustrates this fact. The tooth, so far from being more discolored, was absolutely whiter than when the operation was finished.

In regard to the objection that may possibly exist in some minds of the danger of using an acid in this way, in contact with tooth structure, there is really nothing in it. The active combination of the acid with the lime neutralizes the danger in that direction. No effect is produced on the dentine of an injurious character. I have bleached the frailest teeth, with nothing but the thinnest film of enamel remaining on the labial surface, and have, invariably, failed to discover any injurious results. The time required for bleaching is dependent upon so many circumstances, that no fixed rule can be laid down. The judgment of the operator must alone determine when to cease, and fill the cavity.

As before remarked, it is necessarily a tedious operation to both dentist and patient, and my advice would be to those who rate all their time as so much gold, not to undertake the operation at all; but rather refer their patients to some one who regards professional excellence paramount to all selfish considerations.

ANNUAL ADDRESS.

Delivered before the Brooklyn Dental Association, June 10th, 1868.

BY W. C. HORNE, D. D. S.

[Published by request of the Association.]

MR. PRESIDENT AND GENTLEMEN:—We have gathered to-night to celebrate the sixth anniversary of the Brooklyn Dental Association, a name which, more than any other connected with our profession, is suggestive to use of kindly memories and genial sympathies. We have

seen this society, within the few years named, grow from a small handful of warm-hearted men, to an association numbering some three-score members, known wherever the literature of our profession penetrates, and quoted full often as a model for the liberal spirit which pervaded and directed its course. This oneness of feeling has been due to the fact that, without restrictions of rules and laws, we have met on the common platform of doing each other all the service possible; so long as this spirit prevails in any society, no matter what its specific object, it must be successful; while self-seeking quickly destroys the most flourishing organism. I shall endeavor, in my remarks before you this evening, to scan the rise, progress and influence of the associated effort represented by the name of this society, and leave you to make such deductions from the brief epitome as may seem proper.

It was owing to the desire of many dentists in an older society to send delegates to the American Dental Association, (a desire opposed by the short-sighted jealousy of some of their colleagues,) that it was determined to inaugurate a new society which should be above such unworthy prejudices; and to-night when we revert with satisfaction to all our past history which culminates in this crowning festival, it should awaken no feeling but pleasurable pride on their parts, and thankful appreciation on ours, when I name as the authors of this effort in mutual learning and teaching, our President, Dr. Parks, with our worthy friends, Drs. Hurd, Atkinson, W. H. Allen, Perine and A. C. Hawes; these were the original founders of the association. The brief and modest preamble with which they prefaced their simple constitution, struck the key-note of their future success, and gave rise to that harmony so long undisturbed by any discord. It reads thus: "We, the undersigned, dentists of New York and Brooklyn, believing that frequent intercourse and interchange of opinion will secure greater unity of feeling and action, and lead to individual improvement and the elevation of our profession, do hereby form ourselves into a society under the style of 'The Brooklyn Dental Association.'"

How their faith has been rewarded, this audience are the witnesses; frequent intercourse and interchange of opinion, conducted with gentlemanly courtesy and due regard for the opinions of others, have been to the dentists of this circle of greater value than any other means within their reach of advancing their professional knowledge and skill. We may justly add that no one has had a monopoly of this educational process. We are indebted all round, and, by consequence, may each claim to be in some degree creditor; a claim, I think, that will be readily conceded.

Our association has been something more than a debating society, even though, at times, we may have thought words took the place of wisdom. We have learned to have our own opinions, and, better yet, to have

reasons for those opinions, which we have no fear of being hectorred out of. I am sure that manliness of character has been developed by our intercourse, and that any approach to pusillanimity would be lost in the general contempt. What has done more than aught else to establish and maintain intimate friendly relations among us is the social feature of our society. Meeting at each other's houses, becoming familiar with each other's offices and implements, inspecting each other's contrivances, and applauding each other's labors; partaking of each other's provision of wine and fruits, or delicacies for which we have been indebted to the fair hands of unseen, though not unknown benefactors. While some have justly, in their judgment, preferred the pure dew of heaven or the cup that cheers but not inebriates, we can avow that no intemperance, ever so slight, has marred the wholesome gladness of our festivities. With how much eager but fraternal strife we have discussed our mallets and our wedges, anæsthetics and hemostatics; given Colton's gas fits, and taken fits from Colton's gas; praised Barnum's dam and foresworn the napkins; condemned amalgams and declared gold only better than Clowes' amalgam; extirpated exposed pulps and pronounced against pulp extirpation; anathematized tooth extraction, but maintained a lively interest in artificial substitution; gone deep into abscesses which sometimes proved bottomless abysses. We have had essays and dissertations, and have not lacked for poetical effusions. Remembering its true vocation as a school of practical experience, our society has fulfilled its mission, and also fostered every worthy enterprise of the profession calling for its recognition.

So long ago as 1862 action was taken looking toward the establishment of a dental infirmary, by the appointment of a committee to procure clinics in the various hospitals and charitable institutions of this city; though no immediate success attended the effort, yet the project was not abandoned, only held in abeyance. In 1864 a plan for a dental college was broached, and received favorable consideration. It occupied much of the attention of this and the New York Society of Dental Surgeons throughout that year, and early in the winter the New York Institute of Dentistry, a voluntary school, was started under the auspices of Dr. Atkinson and others, and continued its session to the spring; by which time a charter was obtained from the Legislature, by the same parties, backed by your petitions, exceedingly liberal in its provisions, creating the New York College of Dentistry. Upon the organization of that institution, the conduct of the educational department was confided to others than those by whom, in the incipency of the movement, it had been conducted. Changes were soon forced in the board of corporators, which had the effect of seriously impairing the confidence of the profession in the conduct the institution.

That New York is pre-eminently the place where a dental college might prosper is, I believe, universally admitted; we have all the advantages a great metropolis affords for such an enterprise; the opportunities for obtaining skilled teachers should be unequalled, when we consider that no where can better dentists be found or in greater numbers, and, in consequence, dental students, too, are abundant; and our city presents attractions to young men all over the country which no other on this continent can rival. It is only necessary that its dental school should be on a level with or approach those in other cities in efficiency to insure its abundant success.

But to change the theme; we have all had a hand with *Wait vs. Good-year*; have played a heavy game, and have lost our rubber. To escape from Bacon we fled to Curtis—flying from Scylla we rushed upon Charybdis. “How not to do it” has been well accomplished, and some time you may learn the method.

The Code of Dental Ethics has not yet proved salutary. First one of our honorary members flew in the face of it; next the late “head of the profession” fell upon it. With the head infected, the disorder among the minor members of the body threatens to become fatal. * * *

Through all vicissitudes we have been favored with success; instead of one we are many. From our midst has sprung the New York College of Dentistry. This has taken still others into its fold. Next arose from the same circle the New York Odontological Society—the first incorporated dental society in our State; again, the mother sees her features duplicated in the new Brooklyn Dental Society. By provision of an act of our last Legislature, societies have been formed in each of the judicial districts of our State, which, with a State society shortly to be organized, will afford practitioners throughout the State with means of intercourse far superior (at least in the rural districts) to those heretofore enjoyed; and it may be safely assumed, that the influence of these societies, on the footing authorized by the law incorporating them, must tend to raise regularly qualified practitioners of dentistry to a position in public estimation commensurate with their professional ability.

The efforts of individual members, as well as our associated influence, have always been directed to the development of improved modes and means for securing the highest excellence in our professional operations, and most gratifying success has been attained in these particulars. Our special thanks are due to those gentlemen who have favored us with the results of their experiments and studies; whether directed toward the improvement of instruments, of appliances of facilitating operations, in modes of practice, or for clearer views of the principles of procedure.

When we compare our offices of to-day with those of six years ago, we observe the valuable additions made to our implements. When we look upon our operations, we rejoice at their superior excellence.

Nor has the influence of this society been confined to those who have, from time to time, thus met. The Journals devoted to our specialty have been instrumental in diffusing a knowledge of and an interest in this association. At home we may not be aware of it; but outside of our own circle, we find the Brooklyn Association known, and its proceedings watched with interest and pleasure. It has been my good fortune to find, wherever I may have strayed, that the name of our society was a passport to its members, insuring them of honorable welcome and kindly consideration. Nor is this to be wondered at; for in turning over the leaves of the Journal, which has most regularly been the mouth-piece of the society, it will appear that reports of its proceedings have filled near one hundred printed pages, with an even greater number occupied by original papers from the same source. There is ample scope in our field of labor for the full development of every variety of talent. None need fear that there is no place for him; our doors are always open to welcome those whose aim is one with our own—the advancement of dental art and science.

Thus, we have prospered on all this way that we have come. To-night we look at that picture and on this, and we know that the result of our association has been to make us better dentists, better appreciated by each other and by the public; with better houses, better offices and better business. Shall we not thank God, and take courage? Some of us have felt the hand of affliction in that time by loss of wealth, of health, or of those who have gone from our earthly dwellings to eternal mansions; may I not say, we have felt each other's sorrows, as well as shared each other's joys?

Mr. President and gentleman, if I may be excused for anything personal, accept my thanks for the courtesy which singled me out to address you on this occasion. I take it, not as an evidence that you deemed me the most befitting speaker, so much as a concession that no one would be more ready to perform any service which you might require. My grateful acknowledgments are due you for the uniform kindness and consideration which I have received at your hands throughout a long and intimate acquaintance. I trust that the friendships here formed may be as lasting as they have been useful and agreeable. As the remembrance of the past is pleasant, so may your future be serene: may peace and prosperity attend you, and the pleasant hours we have spent in taking counsel together, be a green spot in your memories to your latest days.

OXY-CHLORIDE OF ZINC AS A CAPPING.

BY JAMES TRUMAN, D. D. S.

All of us, who can recall the history of Dentistry but a few years, remember how earnestly and persistently the advocates of capping nerves, held as their opinion, that it was *the* mode, above all others, in the treatment of this troublesome organ. We also remember how, by degrees, this positive opinion was modified, until all, who aimed at the best results, adopted extirpation of the pulp and filling the fangs. We are now repeating history again, but this time it has assumed another shape, and, for aught known to the contrary, may produce better results.

This consists of the use of oxy-chloride of zinc over an exposed pulp. The enthusiasm of its advocates seems to have reached its ultimate, judging from an article in the June number of the *Dental Cosmos*. We must not only use this comparatively new idea at once, but any hesitation to depart from a process, well tried and well tested, promises to bring down on the devoted heads of unbelievers the anathemas of the writer. Indeed, he anticipates this by a charge upon their obduracy in advance. It would seem to be well for those who are not prepared for this, to hold themselves aloof from this "demoniac reign in the practice of the vast majority," and incline their ears to the "*angel voice*" that calls with plaintive exhortation to "come out and be separate from this sin." Now, it would seem, that oxy-chloride might well implore to be saved from the injudiciousness of its friends.

That this article, used in this way, has been sufficiently tested as yet, it is not possible to believe; yet, the results so far attained, certainly warrant the conclusion that it is possible to retain the vitality of the pulp under such a protective shield. The reports of Dr. Salmon, of Boston, are very instructive on this point, and his well-known character for painstaking efforts to arrive at correct conclusions, is a sufficient guarantee for the truthfulness and carefulness of the tests reported. My own experience in its use does not justify an opinion for or against the use of this article as a capping. I have tested it in a number of cases, and, so far, with variable success. In one case, the pain consequent upon its introduction, continued, according to the patient's statement, for two weeks. At the expiration of that time, I was obliged to remove it and extirpate the pulp.

It is, certainly, desirable always to save a part, where it is possible so to do, and if this will accomplish it, no greater boon has been granted to a suffering public and an over-worked profession. Sufficient good has already resulted from its use, to justify full and extended tests of its merits.

In this connection, it should be stated that whatever credit may accrue from its presentation to the profession is, I believe, due to Dr. Keep, of Boston, although other gentlemen have used it for this purpose for years previous to this. Dr. Walker, of Owego, New York, has capped pulps with this material almost since its first introduction. I recently met with a molar treated by him over seven years ago, which, at the present time is entirely comfortable, and presenting every evidence of entire vitality in the pulp. Dr. W.'s failure to make the fact known, is a lesson many should take seriously into consideration. Every *positive fact* should be published, and there is now no excuse for any dentist retaining within himself any mode of treatment that he has thoroughly tested. In order that men may be encouraged to spread broadcast new truth, a conscientious endeavor should be made to give proper credit always to the originator—a feat it seems impossible for some writers to accomplish, especially some connected with the New York Society of Dental Surgeons.

It is to be hoped that many may be induced to keep tabular records of cases, similar to Dr. Salmon. By so doing we shall soon be able to decide upon the merits of this treatment.

THE "STRING DAM."

In several of the recent Dental Journals have been statements of the value of the so-called string dam in filling teeth. This is simply binding the tooth with a waxed cord, passing it around an adjoining tooth. Its object is to replace the use of the wedge, either in situations where that is not indicated, or where the patient raises serious objection to its insertion. No approximal filling, wherever situated, can be successfully accomplished without the aid of some material placed at the cervical portion of the tooth, to shut off all moisture from that direction.

The use of a cord for this purpose is very old. It was taught as a valuable adjunct in filling by the late Dr. Elisha Townsend, at least sixteen years ago, and has probably been used very generally in the profession.

A much better article to use for this purpose, is a ring of rubber, cut from the ordinary tubing. This placed well up on the neck of the tooth and sprung around a distant tooth, forms an effectual dam and one very easily applied. It is much better to use two of these rings operating in different directions. So valuable has this mode of protecting the cavity become in my practice, that it has almost entirely superseded the use of wedges. These, while they are at times impossible of application, are always painful to the patient, while the rings are almost painless, and are only in a minor degree annoying.

J. T.

Dental Societies.

NEW YORK ODONTOLOGICAL SOCIETY.

At a regular meeting, held February 12, 1868, Dr. C. H. Marvin presented a report on Kearsing & Bro.'s fibrous gold. In regard to its working properties, he considers—1st. That it requires a “retaining pit, sharp angle, for the first piece.” 2d. Its cohesiveness is of a “high order, and may be relied on with certainty.” “Great care is necessary in finishing next the walls of the cavity. It is just here that most of the failures with crystal, plastic or fibrous gold occur. With careful observation of its properties, and the peculiar mode of manipulation best adapted to them, absolute certainty can be felt as to results—that they will be good—that centre, surface and edge may be equally solid, equally unified, equally enduring.”

Dr. Rufus King Brown presented his views on the character and contents of the dentinal tubules. He first takes up for consideration the “notion” that some men are possessed of in regard to the dental tissues. The first, in order of importance, he considers the so-called “dentinal fibrils.” “These have been imagined to be *nerve fibres*, and we have frequently seen the assertion made that these nerve fibres have been demonstrated. I cannot persuade myself that whoever makes this claim has ever really seen a single nerve fibre under the microscope. * * * In all their characteristics, except the physical one of elongation of shape, these two are totally unlike, and most unlike—in short, have no resemblance.” The size of fine nerve fibres, he says, “are not less than the $\frac{1}{50000}$ to $\frac{1}{65000}$ of an inch fine. The dentinal fibrils are about the $\frac{1}{8000}$ to $\frac{1}{10000}$ of an inch. The smooth continuity of the latter is so unlike the remarkable *un-smoothness* which is a conspicuous peculiarity of the fine nerve fibres” that he decides there is no similarity between them. “If nerve fibres, their continuity with nerves of the pulp could not fail to be traced or observed. But, with the highest powers of the microscope, this connection has failed to be observed.” He argues further, “that these fibres are extensions into the dentine of connective tissue.” He “imagines” this connective tissue may “embody the function of sensibility for the teeth.” In regard to the “coagulated fibrin theory,” he uses this language: “I trust, on their behalf, that the day is past when members of this fast learning and rising profession, will be found listening gravely to statements of the ‘geology’ of the teeth, or that a structural part of the tooth is an elongated particle of a coagulum of fibrin.” He then proceeds to give his theory of the “character of the process of dentification.” “In dentification it is openly certain that the earliest portion of the process begins

within the tooth papillæ by minute cells, the progeny of special cell-growth, flattened into a number of sides or faces, by mutual compression. These cells incorporate the lime salts, particle by particle, into the body and substance, forming the enamel. The dentine is formed by a process of incorporation of lime salts in the matrix. This matrix parts with its least dense, or watery particles of composition. The lime salts are taken up for these, and so the substitution goes on." The speaker further contended that the supposition that the tooth tissues constantly lost and gained matter, was a fallacy. The only absolute waste was by caries.

Dr. Marvin read a paper on "Temporary Fillings." He advocated the use of this character of filling in children's teeth. Also in a class of cavities with the pulp nearly exposed. A temporary filling placed here of some non-conducting material, will, in a few months, exhibit a marked change, from extreme sensitiveness to that of "comfortable quiescence." As a test, in roots of teeth where the pulp has been destroyed, they have great value. He uses for strictly temporary purposes, Hill's or Bevan's fillings. He does not favor the so-called "bone fillings." Considers their use dangerous in sensitive teeth.

NEW YORK SOCIETY OF DENTAL SURGEONS.

At a meeting held November 6, 1867, C. S. Weeks performed the experiment of burning red vulcanite, and collecting the vapor of the reduced sulphuret of mercury in a porcelain vessel. With a bit of cotton wool, moistened with nitric acid, he collected the globules, with which he then mercurialized a piece of sheet brass. He believed that rubber plates irritated the mouth more than metallic ones. The dark, almost black color, noticed on the lingual surfaces of many plates, he believed due to a slow reduction of the sulphuret.

Dr. Bogue mentioned a regulating case which he had inserted, "during the wearing of which the patient had suffered from turgidity of the gums, diarrhœa and emaciation. The wearing of the plate was intermitted two or three times, with marked improvement during its removal. Black vulcanite was then substituted, with the effect of a speedy return to health."

At a meeting held February 12th, Dr. B. W. Franklin said he had succeeded in getting a solder for aluminum, and had made some improvements in manipulating the metal, by which he was enabled to produce three plates on the aluminum in the time required to make two on vulcanite.

Dr. Fitch "denied that rubber plates act otherwise than mechanically upon the mouth. They dam up the follicles, by which the mucus is retained, until it becomes acrid and produces sore mouth."

Dr. Keep, of Boston, had formerly employed aluminum for making den-

tal plates, but had abandoned it because it would not withstand the fluids of the mouth.

Mr. Heindsman exhibited a partial plate of aluminum, soldered with an alloy of the same metal.

February 16th. Dr. J. S. Latimer had been able to greatly improve the color of dark teeth by means of the hypochlorite of lime, but that he had been unable to prevent a return of the color.

Dr. Francis bleaches by first filling the root permanently, then the crown with chalk and a solution of chlorinated soda. Had not much faith, but still continued experimenting.

Dr. Atkinson sometimes failed to permanently better the shade of dark teeth. He bleaches by placing crystals of oxalic acid in the tooth, and then applying a drop of water on cotton. A few minutes suffice for bleaching.

Dr. C. E. Latimer had that day bleached a tooth with hypochlorate of lime placed in the cavity and moistened with acetic acid. The process required about thirty minutes. He did not wet the cavity with creasote, but filled at once.

He digressed from this subject to say that he had tried the cantharidal collodion for the relief of acute periodontitis, and was pleased with the result. Dry the gum before applying it. He had made some by mixing tinct. of cantharides and collodion, equal parts.

LEBANON VALLEY DENTAL ASSOCIATION.

Drs. Brown and Moffitt, each the inventor of new methods of mounting teeth, explained and set forth the claims of their respective inventions.

Dr. Brown's method is protected by letters patent, and consists of attaching teeth to swaged plates by means of any fusible metal or alloy.

Dr. Moffitt's, known as "Adamantine Base," is not patented, but free; compensation derived from sale of flasks and metal. The advantages set forth are, that it can be made as thin as silver, very light in weight, inoxidizable, non-expansive or contractile, easily mended, and can be made up in much less time than rubber.

Correspondence.

The following correspondence will, we think, be found of interest to some of our readers. We give it without comment.

1221 SPRUCE STREET, PHILA., January, 1868.

MR. JOSIAH BACON.—*Sir*:—I received, in common with others in this city, a notice to settle up with your Agent for past, so-called, infringements of the patents claimed by the "Goodyear Dental Vulcanite Com-

pany." Having performed all that you demanded through your Agent, I now wish briefly to give my views of what I consider to be the injustice you are guilty of to a portion, at least, of the dental profession. I have reserved this opinion until I had settled all claims, that the charge of begging clemency, in my particular case, could not be held against me.

In illustration of what I mean, allow me to cite a case. Suppose an individual had, from the commencement of the use of rubber as a base for teeth, refrained from performing this work himself or of having it done on his premises; but had endeavored conscientiously to employ only those who had licenses from the Company to make the article, under the supposition that by so doing he was not an infringer of any rights supposed to inhere in said Company, would you consider you had any moral or honest claim against such a man? I am well aware that you can shield yourself behind the patent law, and assert that *he* was the principal in the violation, no matter how innocently it may have been performed.

I cannot myself see how you can make a legal distinction between the *patrons* of a "laboratory man" or mechanical dentist. He is at liberty to make cases for patients, and those patients are not *infringers*. How can you say that the dentist is not just as truly a patient in an enlarged sense? Would not the manufacturer have an undoubted right, after having paid for a license, to manufacture an article, to sell it to the wholesale merchant at a much reduced price to allow a margin of profit? According to my view the mechanical dentist occupies precisely the same position as *that manufacturer*. He has his fixed prices for his patients that require but a single case, while he fixes another and reduced price to the man who procures a larger number of sets from him. To my mind, it is clear the cases are analogous.

Does, therefore, the forcing of money from such men, comport with your ideas of strict justice? It does not to mine, and every dollar so taken, it seems to me, is only yours by the force of law, which is not always either strictly just or strictly honest.

The case cited is precisely my own, and while the amount wrongfully, as I conceive, forced from me is but small, the principle involved is of sufficient importance to justify this communication, especially as many are undoubtedly in the same condition. I think in your subsequent settlements, these men should receive some consideration.

Yours, &c.,

JAMES TRUMAN.

GOODYEAR DENTAL VULCANITE COMPANY, }
BOSTON, June 16, 1868. }

DR. JAMES TRUMAN.—*Dear Sir:*—Yours is at hand. I much regret your uncalled for bitterness of feeling. We can only hold responsible

to us those whom the law says are responsible and shall pay. I do not believe there is a man in your profession, who did not know during the past two years, or the greater part thereof, his liability, and the idea of shifting it off to laboratory men cannot be permitted. I have paused with your city, to give every opportunity of investigation, that no complaint should be made, being assured by many of your leading men that this course would bring all around right; but my forbearance has been abused, and it has been said that I dare not attempt to enforce our claims in Philadelphia; but I thought it was about time equal justice to those around in other places demanded a different course. I only desire what is right and fair. I have compelled all other places to pay for their past work. Why should not you?

I cannot see that your complaint is upon any just ground. You say that you only employed those who had a license to do your work. But no licensee has the right to vulcanize for one *without* license; it is an especial clause to this effect, and the vendor is the one we look to.

I trust that, hereafter, no difficulty may arise, for I intend that in Philadelphia, as elsewhere, *every man*, using rubber, shall either be under license or under injunction.

Yours, truly,

JOSIAH BACON, *Treasurer.*

Editorial.

NOTICE TO CORRESPONDENTS.

All communications intended for insertion in the original department of the TIMES, must be furnished to the Managing Editor, Dr. James Truman, 1221 Spruce street. All communications relating to the business department must be directed to Dr. T. L. Buckingham, 243 North Ninth street.

CHANGE.

It will be observed that we have departed from the plan adopted and carried out from the issuing of the first number of the TIMES, to confine it entirely to original matter. We are satisfied much valuable material may be condensed from other Journals, that will not only make our Journal more instructive, but, at the same time, render the contents of that varied character that will make it more entertaining to the mass of our readers.

CORRECTION,

In the last number there occurred a very annoying typographical error. Upon page 170, the name of the German quarterly should read *Deutsche Vierteljahrsschrift*, edited by Dr. Ad. Zur Nedden, instead of *Zu Nedden*, as the types made it.

A DEGREE EASILY OBTAINED

Is the heading of an editorial in the *Baltimore Journal*, for May, 1868, and, as it refers to some acts of the Pennsylvania College of Dental Surgery, it becomes necessary for us to make some explanations. The first paragraph in the article calls for no explanation, except to show that the writer cannot copy correctly, even when he has the printed matter before him; for, by comparing this with our printed conditions for graduation, the reader will see that the writer says, "that five years actual practice," while our printed terms are, "having been in practice five years, inclusive of term of pupilage." But the next paragraph is of more importance, and we copy it in full, inserting the *italics* as they are in the original.

"A student from Carlisle, Pennsylvania, who has had *less than two years of pupilage* and *no practice*, had conferred upon him at the late commencement of the Penn. College of Dental Surgery the degree of Doctor of Dental Surgery, after attending but one course of lectures.

"These facts we are ourselves cognizant of, and can also prove by letters received from gentlemen of the highest character."

Allow us, now, to make an explanation of the case, and present the certificate on which we acted. I received a letter dated September 18th, 1867, from the student referred to, stating that he had been in practice since 1860, and asking if he could present himself for graduation by attending one course of lectures, (I have the letter now before me.) I do not know what answer I returned, as I did not keep a copy of my letter; but I suppose I answered as I usually do in such cases, telling him he would have to bring a certificate of the time he had been in practice, and enclosed a circular with our terms of graduation, as they are in the announcement in the back of the *TIMES*. On the 4th of November he called and matriculated, and brought the following certificate:

CARLISLE, PA, November 1, 1867.

This is to certify that my son, T. L. N., has been engaged in the practice of dentistry since 1860. J. N.

On this certificate he was admitted as a second-course student, and permitted to come up for graduation. The father I knew to be a dentist, as he was some time with me in my laboratory in 1850 or '51, and I had heard of him occasionally since; as for the son, I did not know that he had one until I received the letter from him in September.

Now, we submit the case to the profession for them to decide whether we had sufficient evidence to allow us to graduate the student on one course of lectures or not. We have also the statements of other parties, which were obtained after the publication was made, and, in order to present the whole case to the profession, we insert them here.

CARLISLE, PA., May 13, 1868.

DR. T. L. BUCKINGHAM, PHILA., PA.—*Dear Sir*:—My attention has been called to a statement published in the *Baltimore Journal of Dental Science*, referring to a “Student from Carlisle, Pa., who had conferred upon him the degree of Doctor of Dental Surgery, and who had less than two years pupilage and no practice.”

Permit me to say, in answer to this, *that the statement is a falsehood.*

I commenced the study of dentistry with my father, in 1859, and, in consequence of his frequent absence from home, (having an office also in Newville, Pa.) I was at times left without a preceptor, and was requested, by G. W. Neidick, D. D. S., in 1860, to pursue my studies with him, which I did until the breaking out of the Rebellion, when I, in common with many of our citizens, entered the service, and, after being disabled during the Peninsular campaign, in 1862, was discharged, and returned home and resumed my studies with my father, and during the *two years* previous to my entrance at your Institution, I was employed as an assistant by Dr. G. W. Stine, of Harrisburg, Pa., and during his absence was frequently *left in sole control of his office.* That he should have done so, proves, beyond a doubt, that he had confidence in my abilities.

In reference to “the cause of this attack,” I presume it originated with Dr. F. J. S. Gorgas, Dean of the Baltimore College of Dental Surgery, who, some time since, in a business transaction with a friend of mine, acted, in my opinion, in a very ungentlemanly and unprofessional manner.

During the month of April I was at Harrisburg, and was one day accosted upon the street by Dr. Gorgas, and *I declined having any conversation with him whatever—turned my back upon him and walked away.*

This proceeding so exasperated him, that I suppose at the time he resolved to do me an injury if possible, and this is the only reason I can assign for this unprofessional and ungentlemanly attack upon one so young in the profession, and I cannot think that there is another man in the profession, who is so lost to all claims of those finer feelings which constitute the true gentleman, who would resort to such a cowardly and unprincipled method of securing revenge *to gratify personal feelings.*

I have no desire to indulge in personalities, but, if it becomes necessary, I am in possession of such facts as will satisfy the author of said statement, or any of his friends.

I sincerely regret its publication, as it may reflect discredit upon your Institution, and yet I cannot think that any unprejudiced person, who, knowing of the jealousies existing between rival institutions, and knowing the circumstance and cause of this attack, would, for one moment, entertain the thought, or charge you with deviating from your rules and requirements.

I shall be pleased to hear from you again on this subject. Thanking you for your past kindness, I am, sir, very respectfully, your obedient servant,

T. L. N.

We will pass over the next paragraph, and take it up in connection with another further on; we then read:

“The following extract from a letter received a short time since needs no comment:—‘*Dear Sir*,—I have attended one course of lectures in the Pennsylvania College of Dental Surgery. I went there under the impression that it stood the highest of its kind. I have since learned

some facts which, if proven true, leave me to place very little value on a diploma coming from that institution. Will you be kind enough to inform me whether, on the strength of that one course, I could be admitted as a second-course student at the next term of the Baltimore College?"

This is very ambiguous. "I went there under the impression that it stood the highest of its kind." Well, did he still retain that impression when he had attended the course? or was it only after he had learned some *facts* that he thought of going to another college? and from whom did he learn these *facts*? some one who was friendly or an enemy to us? These are questions I suppose that could be answered. And there is another curious thing about this sentence: "learned some facts which, if proven true." Now, I always understood that *facts* were truths—Webster defines them to be "stubborn things," and "to deny a fact knowingly is a lie." We are left in the dark on all these points, and also whether they admitted him to a second course. Whether they did or not in this case we must remain ignorant, but we have seen a letter since in which they offer to recognize one course in our college as equivalent to one in theirs.

"We have omitted to notice the proceedings of the late commencement of the Penn. College in our Journal, for the reason that we are not certain how many others of the graduating class obtained the degree in the same manner; not feeling disposed to acknowledge Doctors of Dental Surgery thus made."

"In an editorial published in the March number of the Journal, it was stated that we had good authority for announcing that the Baltimore College of Dental Surgery had the largest number of students attending the lectures of the past session."

These two paragraphs explain the whole of the article. They had published a false statement in their March number, and they had not the manliness to acknowledge their error.

Poor fellows, have they forgotten the precept that was taught them, or should have been taught them, when they were young: "that they who tell a lie at first and lies to hide it make it two."

And what reasons had they to think that other colleges had not the number of students they published; this very one that they complain of us graduating, they admit was a regular student with us.

"Students are not admitted into the Baltimore College for partial courses, but are required to take out all the tickets, and prove by their attendance on, and attention to the lectures, that they are truly interested in all the branches taught."

This is an intimation that other colleges take students for a partial course. We cannot speak for all the colleges, but we are and always have been disposed to be liberal in Pennsylvania colleges. And we now make this proposition, not only to them, but to all who are interested:

We will give the price of two courses of tickets in our college for each and every one that they can present who have received either a partial course, or a deduction on the published price of the tickets since the college commenced. Now, I hope they will make the same offer.

The latter part of this paragraph it is scarcely necessary for us to notice. They say "during the late war the classes of the Baltimore College were necessarily small, for the reason that a greater number of students attending this College are from the Southern States," and could they not have added that the Faculty was small too, as a portion of them were down assisting the rebels?

This article closes with this sentence:

"For this reason the editorial above referred to, in the March number of the Journal, was written."

This sentence is so obscure that we cannot make out its meaning. The editorial in the March number does not refer to anything outside of their College, except the statement that they had thirty more students than any other College, which has been proven false by their own statements, for they have published the number in two other Colleges, one having forty-one and the other forty-four students, while they only claim to have had sixty-nine. But in another editorial, they say they might have had eighty-five, and in their report, in another place, they state twelve or fifteen more would have come to them under certain conditions. So it appears very uncertain how many they might have had, if their rules had been different.

Having examined this article by paragraphs, I might now comment on its general tone, for it carries with it the feelings of the writer, which the reader must see is not friendly, but of the most malignant character. But I have extended this article already longer than I intended, so I must close.

T. L. B.

GOODWILLIE'S CIRCULAR.

DEAR SIR.—*Please sign this, and return immediately to D. H. GOODWILLIE, 56 Clinton Place, New York City.*

WHEREAS, The Pennsylvania College of Dental Surgery, has, within the last few years, granted diplomas to persons who have been in practice since 1852, without attending its lectures in accordance with its original rules, but has granted the degree of Doctor Dental Surgery, in some cases, we are pained to learn, without a sufficient examination—which proceeding tends to lessen the value of the diplomas granted by the said College, both past and prospective; and

WHEREAS, Such a course is unjust to the regular graduates, and tends to lessen the value of Dental Diplomas *generally* and thus strikes a blow at the very foundation of professional education; and

WHEREAS, The said College has refused to co-operate with the asso-

ciation of Dental Colleges in their endeavor to elevate the standard of graduation; therefore

RESOLVED, That we, the alumni of the Pennsylvania College of Dental Surgery, do most earnestly protest against the practices named in the above preamble, as a flagrant wrong to ourselves, to our beloved Alma Mater, to the profession at large, and to the people whom they serve.

We received the above circular from one of our friends, and publish it that the profession may know the movement that is going on, although we have not received it direct from the parties. It would naturally have been supposed that, if any large portion of the alumni of a college had any serious complaints to make against the course the faculty were pursuing, they would first notify them, and then take other action if their notice had no effect. But the parties above, appear to wish to pursue a different course.

Let us examine this article, and see if we cannot find some other motive for it being issued than that which appears upon its face. The first paragraph is so obscure that we can scarcely make anything out of it. We are charged with granting diplomas to *persons* who have been in practice since 1852, without attending lectures. We published that we intended to do this nearly three years ago, and no objection has been made by a single graduate of the college until now, "but have granted the degree of Doctor of Dental Surgery, in some cases, we are pained to learn, without a sufficient examination." But have we granted the degree to any one not qualified; if we have, will they point out whom? We were charged, a year ago, with graduating these persons to get their influence for the college, and now it tends to "lessen" the value of the diplomas granted by the said college, both past and *prospective*. We did not know that we had granted any prospective diplomas, but if it has been fore-ordained that we should do so, then we must follow out our destiny.

"Whereas, Such a course is unjust to the regular graduates, and tends to lessen the value of dental diplomas."

Can it be possible that any one can think that we lessen the value of our diplomas by connecting with us a class of dentists who stand at the head of our profession, all of whom have had over fifteen, and some of them thirty years constant practice, and, taken as a class, would be an honor to any institution? There is but one way, which we can see, that they would be likely to lessen the value of any diploma, and that is, by refusing to recognize some who have received the regular degree.

The next charge in the circular explains, in a measure, the cause of its publication—"has refused to co-operate with the Association of Dental Colleges in their endeavor to elevate the standard of graduation."

Is this true? If they will look over the published proceedings of the Association, they can see that we were willing to adopt all the rules

that had been passed by this Association, and would have faithfully lived up to them; and it was only when they had transacted all the business, and saw proper to pass a vote of censure upon us for graduating the class of dentists referred to above, that we drew off from them.

But what have they to say to the other College that has separated from the Association, without giving any reasons, whatever, for so doing?

There are probably other causes for the circular that are not apparent on the face of it. The individual, whose name appears at the head, graduated with us, and, afterwards, was appointed Demonstrator of Operative Dentistry in the College, which position he held for several years; but the Faculty was compelled finally to ask him to resign, which they did unanimously, and since that time there has been lurking in his and the minds of some of his friends, a little revenge, which has at last cropped out.

T. L. B.

NATIONAL MEDICAL CONVENTION ON FEMALE PHYSICIANS.

The Committee on Medical Ethics, at the annual meeting of the American Medical Association, held recently at Washington, made a report on consultation with female practitioners, closing with the following resolution:

Resolved, That the question of sex has never been considered by this Association in connection with consultations among medical practitioners, and that in the opinion of this meeting, every member of this body has a perfect right to consult with any one who presents the "only presumptive evidence of professional abilities and requirements" required by this Association, viz: "a regular medical education."

This resolution, coming up on the second day of the Convention, gave rise to a lengthy and spirited debate, in which Dr. Atlee, of this city, took a prominent and active part in support of the recognition of women as physicians, who have had a regular medical education. The resolution was finally indefinitely postponed.

Perhaps, this was the only course such a Convention could take; but it must be evident to every one, conversant with the subject, that female M. D.'s are a fixed fact, and recognition or non-recognition will not now prevent it. Hence, the wisest course for the medical profession, generally, to take, would be to endeavor to exercise a controlling influence upon their education, to render it as full as any other class of students. Postponement from year to year, but increases the future difficulties surrounding this vexed question, that sooner or later must be met.

In the State Medical Convention, we notice from a report in the daily papers, that the subject has been brought before that body by a resolution of Dr. Atlee, of Philadelphia, interpreting the code of ethics to allow the admission of female physicians. One session was mainly occu-

pied in its discussion. It was finally defeated by the close vote of 37 to 45. This vote indicates that the final triumph of this, or a similar resolution, cannot much longer be deferred.

THE AMERICAN DENTAL ASSOCIATION.

This National Association will meet on the 28th of July next, at Niagara Falls. We anticipate a large gathering, for aside from the surroundings of the place to attract, the interest in dental education and elevation of the profession never was more vitally in earnest than now.

We do not expect that a mixed meeting, as this, will be one in which a large amount of real scientific work can be performed. This must be done elsewhere; but these annual gatherings exert a powerful stimulating influence, which is felt to the remotest parts.

The Convention has a duty to perform in ridding itself of those characters who infest it for paltry selfish purposes. We allude to patent right men, and those who sustain them. No man should be allowed to act as a delegate who has any interest, near or remote, in any patent. We wish not to be misunderstood by this positive expression. We have no objection to a professional man devoting his talents exclusively to his own benefit; but we do object to his being placed on a level with those who unselfishly devote themselves and their abilities to the improvement of their profession. In our opinion, not only patent hucksters should be kept out as members, but all who have stock in any patent organization.

We append the following call for the meeting, received from the chairman of the Committee of Arrangements:

AMERICAN DENTAL ASSOCIATION.

The eighth session of this Association will be held in Grant's Hall, Niagara Falls, beginning on Tuesday, July 28, 1868.

The following arrangements have been made with regard to accommodations. The International Hotel will receive members of the Association at \$4 per day, a reduction of 50 cents per day from their regular terms. The Spencer House charges \$3.50 per day. By giving timely notice to the Committee of Arrangements, apartments will be reserved for members of the Association, especially those accompanied by their families, at either of these hotels.

GEORGE B. SNOW,	} <i>Com. of Arrangements.</i>
B. T. WHITNEY,	
A. P. SOUTHWICK,	

BUFFALO, New York.

DENTAL LEGISLATION.

We are obliged to defer until the next number, the laws recently passed in New York, Canada and Ohio, regulating the practice of dentistry. The efforts being made in this direction in the several States, is an indication of a growing public sentiment that demands the eradication of quackery from our profession. That it will entirely accomplish this, we do not suppose, but it will undoubtedly materially aid to such a result.

☞ An exceedingly pernicious practice has recently been introduced by some contributors to our Dental Journals, of sending their paper to several of these simultaneously, to be published as original in each. The editors of these different publications cannot possibly be aware of this fact until by the receipt of their exchanges they are made conscious of it. To say that it is excessively annoying, is to express it in the mildest terms we are capable of using. Publication in one Journal should satisfy the ambition of most men; at all events, we hope, one journal will hereafter be used as a vehicle for the ideas that are to enter the "original department."

Book Notices.

Deutsche Vierteljahrsschrift für Zahnheilkunde. Organ des Central-Vereines Deutscher Zahnärzte. Redigirt von AD. ZUR NEDDEN, Zahnarzt in Nürnberg.

We have received the April number of the above journal. It contains much valuable original matter. This quarterly, under the able editorial management of Dr. Ad. zur Nedden, is one of the most valuable of our exchanges, and one always warmly welcomed. We should be pleased to present our readers with translations of valuable articles in this number, but want of space prevents it.

Revista Médico-Quirúrgica y Dentística. De los SRES. WILSON Y GONZALEZ, Havana, Cuba, April, 1868.

We have received the first number of a quarterly journal in the Spanish language, under the editorial management of Drs. Wilson and Gonzalez, of Havana. The publication of such a journal certainly marks an era in the progress of dentistry amongst the Spanish residents on this continent. We congratulate the editors on the appearance of their first number, and hope that our Spanish friends everywhere will see that it does not fail for lack of their support.

The American Journal of Dental Science, Baltimore. We regularly receive this journal, heavily freighted with selections from all sources. The editor has for some time seemed to us to be in a state of mental disorder. A short time since he imagined he was the son of a prophet, and undertook to decide in advance, by virtue of his supposed clairvoyant powers, that the Baltimore College had the largest class of any of the colleges in the United States. But, ere two moons had elapsed, his prophecies having failed, his lunacy assumed another shape, and the last we heard from him he was endeavoring to substantiate a theory he had

assumed, that *two* and *two* could not possibly make four. Has the poor man no friends?

The Canada Journal of Dental Science. Edited by W. GEORGE BEERS, Montreal, and J. STEWART SCOTT, M. D., Toronto, June, 1868.

The first number of this monthly journal lies before us, and we congratulate the editors upon the very successful commencement. The profession in Canada owe it to themselves to give it a hearty pecuniary support, as well as to earnestly co-operate with the editors to make it an indispensable medium of communication between them. We sincerely wish it entire success in every respect.

Sanitary Institutions during the Austro-Prussian-Italian Conflict. By THOMAS W. EVANS, M. D., Paris, 1868.

We have received the above work, and consider it a most valuable addition to the history of the different sanitary efforts put forth during the recent war in this country, and of that in Europe.

The first chapter is devoted to the Sanitary Commission of the United States and the Convention of Geneva.

Chapter 2d. Origin of the Prussian Society of Relief for the Wounded, sympathy of the King and Queen of Prussia for the work of the Sanitary Commission in the United States, &c.

The author then proceeds to narrate the history of the Prussian Sanitary Society, from its transformation as a Central into an International Relief Society, and describes, very graphically, scenes at the battles of Langensalza and Sadowa, and the work performed by this Society on those fields of carnage.

He also gives a report of the sanitary work performed in Saxony and Southern Germany, in Austria and Italy.

The Appendix contains an Essay on Ambulance Wagons, Catalogue of Articles forming the United States Sanitary Collection of the Author at the Universal Exhibition.

Selections.

ON THE USE OF OXY-CHLORIDE OF ZINC OVER EXPOSED PULPS.

Read before the Massachusetts Dental Association.

BY I. A. SALMON.

At a former meeting of the Society, I took occasion to advocate the use of oxy-chloride of zinc over exposed pulps, as suggested to me by Dr. Keep, and at that time read to the Society the result of a few cases occurring in my practice treated in this manner. The result to that time having been so favorable, I have since used it with a great degree of

confidence. Could our brothers of the profession be induced to give it a fair trial, I feel sure its use would be very generally adopted, and the present various modes of capping, so often necessitating the use of temporary fillings, and so uncertain in their results, would be dispensed with.

To use oxy-chloride of zinc successfully, considerable care must be exercised. It is important that the materials be pure, and properly prepared.

The oxide of zinc is often impure, containing white lead, chalk and other substances. That of a white color is not considered of as good quality as the yellowish white.

Should there be an excess of the chloride of zinc, its escharotic property will be strongly marked. The strength of the solution used should be only sufficient to cause the mixture to set.

My method of manipulation is to cut from fine linen a small piece, sufficient to cover that part of the pulp I desire to protect; having mixed the oxy-chloride, the piece of linen is saturated with it, a portion being applied to one or both sides, which is then carried upon an instrument and placed directly over the point desired to protect. More or less pain is occasioned, which, however, speedily subsides and does not return.

After a few minutes, and as soon as the mixture is firmly set, during which time moisture must be excluded from the cavity, I introduce the gold, and proceed as in ordinary cases.

I have kept a record of most of the cases in which I have used the oxy-chloride of zinc, and have arranged them in the following tabular order; as facts cannot be disputed, I will give it:

WHY USED.	No. of Cases.	WHEN PERMANENTLY FILLED.
To protect pulps (not exposed,).....	44	At the same sitting.
Over exposed pulps,	27	21 at the same sitting.
		1 in about one week.
		2 " two "
		1 " three "
		1 " four "
		1 " eight "
Over exposed and bleeding pulps,	7	1 at the same sitting.
		1 in about one week.
		3 " two "
		1 " three "
		1 " four "
Making a total of.....	78	cases, in thirty-four (34) of which the pulp was exposed.

In every case which I have subsequently examined, I have found the tooth perfectly healthy and apparently as sensitive as before the application, and, as far as I am aware, have not had a failure.—*Dent. Register.*

PERCHLORIDE OF PALLADIUM IN MICROSCOPIC INVESTIGATIONS.

Dr. Schultze, of Rostock, uses a solution of 1 in 800, feebly acidulated with hydrochloric acid. Small pieces of tissue, by immersion in this, become as consistent as cheese within eight days, and minute sections might then be easily made. Sections may then be deprived of water and impregnated with carmine, whereby parts not colored by perchloride of palladium become red. This substance gives hyaline membranes a light yellow, cells a darker yellow, and nerve-marrow a grayish black hue. The connective and elastic tissues remained uncolored. Unstriped muscular fibres were rendered yellow, and this led Dr. Schultze to the discovery of the arrangement of fibres in the ciliary muscle.—*Amer. Jour. Med. Sciences.*

PIVOT TEETH.

By the following method, which we obtained in a conversation with Dr. T. J. Thomas, a member of the late Graduating Class of the Baltimore College of Dental Surgery, artificial crowns can be attached to natural roots, and what in other cases is the exposed portion of the root, perfectly protected from the action of deleterious agents. Prepare the root, as for an ordinary wooden point; then select a plate tooth of the proper size, shape and shade, and fit it by grinding accurately to the prepared root.

After this is done, enlarge the pulp canal by reaming it out as large as the root will admit: that is, make a conical shaped cavity in the exposed surface of the root, allowing the margin of this cavity to be quite near to the circumference of the root, with slight undercuts on the anterior and posterior walls.

After this cavity is prepared, and that portion of the pulp canal beyond it filled to the apex of the root with gold, make a square metallic pivot of twenty karat gold, alloyed with platinum, in the proportion of five parts of gold to one of platinum. This pivot is made in two parts, which parts are soldered together at the base of the artificial crown, and slightly wedge-shaped.

After this is prepared, a thin piece of platinum plate is bent around the pivot, thus making a square cylinder into which the pivot perfectly fits. After this is done, carefully draw the pivot out of the square cylinder, and solder the edges of the cylinder with pure gold. The pivot is then returned to the cylinder, and the excess of solder and also any rough edges which may exist on the cylinder filed off. After this is done, the cavity in the root is carefully dried of all moisture and protected from saliva by means of napkins, and the square tube or cylinder, with the pivot inside of it, is placed in the centre of this cavity, which is filled around it with gold foil in as careful a manner as any crown cavity, allowing the gold to overlap the margin so as to perfectly protect all of the root from the action of deleterious agents. By such means, what in the case of ordinary wooden pivot would be the exposed part of the root is perfectly protected and enclosed by the gold filling, which at the same time gives support to the square cylinder in the centre of it. In placing the cylinder in the root with the pivot in it preparatory to inserting the gold filling about it in the cavity, the split or space between the two parts composing the pivot should range directly back, from the anterior to the posterior, and not from one approximal surface to the other. When this is done, the pivot is drawn out from the cylinder, which remains firmly fixed in the root, and that part of the cylinder which may project filed down to a level with the surface of the filling. An impression of this surface is then taken with wax or gutta-percha, and a die and counter-die made of fusible metal, by means of which a disk of platinum plate is swaged to fit accurately the concave surface of the gold filling in the root. When this is done, the convex surface of this disk is thinly covered with wax, and the disk placed in its proper position over the gold filling in the root, and slightly pressed on it in order to obtain an impression by which to cut a square hole to correspond with the orifice of the square cylinder. After this square hole is cut in the disk, the outer end of the pivot is inserted in it, secured by means of wax, and the whole returned to the root (pivot in the cylinder) in order to make certain that the pivot is in its proper position, when it is carefully removed and secured by an invest-

ment of plaster and asbestos, in order that the pivot may be soldered to the disk.

This being done, the pivot and disk are again returned to the root, and if found correct, the protruding part of the pivot above the concave surface of the disk is filed down to a level with this surface. This being done, the disk and pivot are returned to the cylinder in the root, and the plate tooth is placed in its proper position and attached to the disk by means of wax. The disk and pivot, with the plate tooth thus attached, are carefully removed from the root and invested in plaster and asbestos, in order that a backing of gold may be made, and the tooth thus soldered to it and the disk.

The tooth is now ready to be inserted, and by separating the two parts which form the pivot slightly at its apex or free extremity, this pivot will tightly fit the cylinder, the two halves acting as springs, which is the object in making the pivot of an alloy of gold and platinum, and also in two parts.—*American Journal Dental Science.*

DEFECTIVE ALIMENTATION.

In an article on "Defective Alimentation a Primary Cause of Disease," by J. H. Salisbury, M. D., Cleveland, Ohio, the following are some of the diseases excited by defective feeding: Vegetable Dyspepsia. This arises from the too exclusive and too long continued use of vegetable, and especially amylaceous and saccharine food. Sooner or later the filamentous stage of yeast vegetation begins, ushering in the acetous fermentation, producing acid stomach, and sour eructations. Yeast plants are rapidly developed in the organ, and every particle of vegetable food that is taken in immediately begins to ferment, the stomach being converted into an apparatus for manufacturing beer, alcohol, vinegar and carbonic acid. Chronic Diarrhœa:—This disease, with the other intercurrent abnormal states that arise from the too exclusive use of a dry, amylaceous diet, may be conveniently divided into three stages—the incubative, the acute, and the chronic.

The following interesting facts are developed on the microscopic examination of the fæces: 1st. That as soon (after beginning to subsist on amylaceous diet,) as gases begin to develop in the intestinal canal, yeast plants begin to develop in the alimentary matters to an abnormal extent. 2d. That this development of yeast plants is evidence of the inauguration of fermentative change in the amylaceous food. 3d. That fermentation and the development of yeast plants continue to increase till diarrhœic conditions are produced. 4th That a peculiar gelatinous colloid matter, usually in little masses, scattered through the fæces, shows itself to a greater or less extent as soon as the diarrhœa commences; that this matter is present in direct proportion to the severity of the case. 5th. That this colloid matter is not the cause of the diarrhœa, but merely the consequence of certain saccharine and fermentative conditions of the system, in which state the connective tissue of the alimentary walls becomes a proper nidus for its development. As soon as these systemic conditions are overcome, this colloid matter ceases to develop, and disappears entirely from the fæces.

On the "microscopic examination of the urine" in "chronic diarrhœa," he finds that the urine is usually small in quantity, rather high colored, and deposits, on standing, a tolerably large sediment of pinkish or brick-colored lithates. The disease is not unfrequently accompanied, and fol-

lowed, also, by obstinate oxaluria and phosphuria. He finds, also, in all three stages of chronic diarrhoea, that sugar is largely present in the faecal matters, and in the mucous secretions of the alimentary canal. There is evidence that the secretions of the mucous membrane of the alimentary canal, fauces, mouth, and pulmonary surfaces, eventually become saccharine. This is evidenced in the development of torular cells and filaments of peneillium in the viscid layer of mucus lining the whole alimentary canal, and the mucous secretions of œsophagus, pharynx, larynx, trachea and mouth, in the latter stages of the disease.

STAPHYLORAPHY.

Dr. Whitehead presented a private patient, a young woman some twenty-five years of age, upon whom he had operated for congenital cleft palate. The fissure had been large, involving both the soft and hard palate, extending forward to the front teeth, and measuring seven-eighths of an inch in width. After three operations he had succeeded in completely closing the fissure in the soft parts, and in considerably diminishing that of the hard palate; so that the patient could now speak more distinctly without an obturator than she had before done with one. The great extent of the chasm had made the operations difficult. The last had been more successful than those preceding it, owing to the Doctor's having passed the wire sutures at a considerable distance from the pared edges; making them very numerous; removing them but two or three at once, and renewing when necessary. The staphyloraphy proper was then complete; but the effort at uraniscoplasty, that is, closure of the opening in the hard palate had, thus far, partially failed, having been attended with alarming hemorrhage and some sloughing of the flaps. The operation attempted, and which the Doctor proposed again to try, is that known as Langenbeck's, which consists in dissecting up the mucous membrane and periosteum from the alveolar process on each side, sliding them towards the centre, and uniting by sutures, the fissure being ultimately closed by new bone developed by the transplanted periosteum.—*N. Y. Med. Jour. Ass'n Medical Record.*

A NEW STYPTIC AND ADHESIVE FLUID.

Dr. W. B. Richardson's experiments have resulted in the formation of a styptic composed of ether, alcohol, tannin and gun-cotton, which is thus described: "The pure tannin is treated with pure alcohol, and digested for several days. Absolute ether is then added until the mixture is rendered quite fluid. The gun-cotton is next added until it ceases to be readily dissolved. A little tincture of benzoin may be added for its disagreeable odor. The solution may be applied with a brush, or in the form of spray, mixed with equal parts of ether. When applied to an open surface of the body, the ether and alcohol evaporate, the blood or secretion of the surface permeates the cotton or tannin, and the tannin acting on the albumen, forms a leathery membrane, which completely protects the surface." This solution may be used, and is recommended by Dr. Richardson, in capillary and other hemorrhages, in open cancer, and on suppurating or other decomposing surfaces, in simple wounds, amputations, etc. To remove the dressing, a mixture of ether and alcohol may be used, or proof spirit warmed a little above the temperature of the body. Cold or warm water will not dissolve the styptic, and should not be used.—*Pacific Med. and Surg. Journal.*

ALUMINUM vs. VULCANITE. AN IMPROVEMENT IN ARTIFICIAL TEETH.

EDITORS MED. AND SURG. REPORTER :

Dr. ALFRED STARR, of New York city, has brought for my inspection and chemical examination a set of teeth fastened upon a plate of aluminum, together with some solder for uniting the teeth to the aluminum plate. I have made a chemical examination of this solder, and find that there is neither mercury, arsenic, zinc or lead in its composition, but that it is composed of a metal which is perfectly harmless in the mouth.

I consider this use of aluminum one of the most scientific improvements in dentistry. Aluminum is the metal of which alum is a salt. For dentistry, it is infinitely preferable to gold, being both lighter and cheaper. Between the use of aluminum and hard rubber there can be no comparison; for, while aluminum is strong, and the lightest of metals, and perfectly harmless in the mouth, hard rubber is thick, heavier, brittle and exceedingly dangerous, there being many instances of mercurial salivation attributed to its use.

The hard rubber used for base for teeth is composed of rubber, sulphur and sulphide of mercury, nearly one-third of the whole being sulphide of mercury. This amount of mercury kept constantly in the mouth, cannot but be sometimes injurious, as it is soluble in the saliva.

In addition to the danger of salivation from the mercury in these hard rubber plates, there are other dangers unknown to the manufacturer. The sulphide of mercury which is added to the rubber is often adulterated with red lead and bi-sulphide of arsenic, both of which poisons are soluble in the mouth. By inserting this in your valuable journal, you will be benefiting the public.

SAM'L R. PERCY, M. D.,
Professor of Materia Medica.

New York, May, 1868.

WALKER'S EXCELSIOR AMALGAM.

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It is economical compared with other amalgams of less price; an ounce of this will go farther, by one-third, than any other amalgam, as it can be worked longer without losing its plasticity, so that less of it will be wasted in using it. It costs but one cent more on each filling than the cheap, poor articles. It requires less mercury than any other amalgam in use, and becomes harder in a shorter time.

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N. B.—The superior quality of this amalgam has induced unprincipled men to counterfeit it. A miserable, poor article, claiming to be "WALKER'S EXCELSIOR AMALGAM," has been traced to parties in Brooklyn, N. Y. The *Genuine Amalgam* hereafter will have our Monogram Trade Mark and Signature on the brown envelope inside. Refuse all others. Buy of responsible parties, or order from the manufacturer.

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The Thirteenth Annual Session, 1868-'69.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation,

and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

ANATOMY AND SURGERY.

The instruction in this department will embrace a plain and comprehensive view of the structure of the human body. The lectures and the demonstrations will be given over *the dead body dissected for the express purpose* of elucidating the subject. With the same object, vivisections on the lower animals, while under the influence of an Anæsthetic Agent, will be employed. Such description of the comparative anatomy, microscopical structure and connections of the teeth, as their importance may demand, will be fully given. The valuable and extensive collections of Anatomical Preparations of the incumbent of this chair, consisting of wet and dried specimens, papier mache manikins, models in wood, and accurate French plates, will enable him to illustrate his course of lectures very clearly.

In addition to the above course, a Surgical Clinic will be held by Doctor Forbes during every week, for the purpose of performing such operations in oral and general Surgery as may be deemed advisable to advance the student in this particular branch of knowledge. The cases will be selected from a dispensary which the Faculty have established.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical peculiarities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND HYGIENE

The intention of the course on PHYSIOLOGY AND HYGIENE will be to convey a knowledge of the essential principles of general and human physiology, in such a mode as will best develop their application to the preservation of health. The subjects of physiology and hygiene will be, to some extent, interwoven, with a constant aim at clearness and simplicity of instruction.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the Demonstrators.

IN THE OPERATIVE DEPARTMENT.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

IN THE MECHANICAL DEPARTMENT.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

PRACTICAL ANATOMY.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

HOSPITAL CLINICS.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

FEES.

Matriculation, (paid but once,) - - - - -	\$5 00
For the Course, (Demonstrator's ticket included,) - - - - -	100 00
Diploma, - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Leidy's or Gray's Anatomy; Carpenter's or Kirk's Physiology; United States Dispensary; Pereira's, Biddle's or Stille's Therapeutics; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Physiological Chemistry; Hartshorne's Principles and Practice of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the subject.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupillage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before

the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

CANDIDATES FOR GRADUATION WHO HAVE NOT ATTENDED LECTURES.—Dentists who have been in continued practice since 1852, are eligible to be candidates for graduation without attendance on lectures. The candidate for graduation, must present satisfactory evidence of his having been in practice for the allotted time, also of his good standing in the profession. He must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must undergo a satisfactory examination by the Faculty, on each of the branches taught by them; when, if qualified, he shall be recommended to the Board of Trustees, and if approved, shall receive the degree of Doctor of Dental Surgery. Of this class of graduates; the matriculation and diploma fees only are required.

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THE DENTAL TIMES.

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Original.

SIX YEAR OLD MOLARS.

Delivered at Litiz Springs, before the Lebanon Valley and Harris Dental Associations,
July 9th, 1868.

BY W. K. BRENIZER.

MR. PRESIDENT AND GENTLEMEN:—It was upon the second Friday in the present month, just two years ago, that I had the honor, as its first presiding officer, of inaugurating the “Lebanon Valley Dental Association,” at Harrisburg; and those of you here to-day who were present upon that occasion, will remember that, in a feeble attempt to indicate a few landmarks for the future welfare of our society, *hobbies* were named as being inimical to the welfare alike of individual and society, and a hope was expressed that in our future career, the “Lebanon Valley Dental Association” would have none of these to deal with. A sample specimen was referred to as existing at that time in some of the dental societies in the metropolis of a neighboring State, and contagious symptoms exhibited in the City of Brotherly Love, upon the subject of the salvation of the six year molars. A promise was then and there made that when, in the future events of the society it should fall to my lot to appear as essayist, I might have something more to say on the subject of six year molars. Old time, in his unrelenting course, has hurried the two years into eternity, and upon their tablets are recorded, for future revelation, the many pleasant meetings of our society, whilst in their grave lie obscurely buried my presidential honors, and I am here to-day, the plain essayist of our meeting, to redeem that promise, and my subject is—*Six Year Molars*.

That the six year molar, in itself, is of no more importance in the mouth at twenty-one years of age, than any other one tooth that may be as good in structure, appears to me to be a self-evident fact, and that whatever might be said of its importance to the well-being of man, might be said with equal justice of any other tooth, is equally true. Take, if you please, a perfect denture of thirty-two teeth in a mouth, with all the teeth in

their places, regular and comfortable, and no signs of decay, and who that professes to be a dentist would extract the six year molars from such a denture? and who that is less than a knave would dare to extract any one of the other teeth from that mouth? But since such dentures are the exception and not the rule to be met with, it has become necessary for the well-being of his fellow-men, for the dentist to be admitted into the family circle, that he may begin his observations *almost* at the side of the cradle. Let me observe here, in passing, that his most important duties at this time are by no means with the child, but he should familiarize himself with the face and features of the parents, and scrutinize closely the texture and relations of their teeth, each one to the other. As the weary traveler looks for foot-prints in the sand of the desert, whereby to regulate his future course, so carefully should a dentist look into the mouth of a father, mother, elder sister or brother, and there read his lesson for the future welfare, by his direction, of those who are following to manhood in the same family.

Considering his origin, he would be a skeptic, indeed, who could doubt the perfection of the teeth of our first parents, in Eden; but since that fatal morning call of Milton's Lucifer, "son of the morning," at the garden, wherein he played the very devil, by introducing all the children of his own begetting, beginning with the oldest *sin* and ending with the last of all—*death*, with all their intermediate offspring—who that is human can restrain a tear over the sad results; and who that is wise would look for perfection in man after carrying within and without and all around him those seeds of death for nearly *six thousand* years, in addition to the very curse of his Creator?*. It was there that harmony was dissolved, and from its disintegration there sprang up antagonisms, hostilities and confusion throughout all of creation. The lion had gamboled with the lamb for man's amusement, made a breakfast of his toy, then fled away to his lair, roaring defiance and death to whatever might approach, and earth, air and water, and even the sun, that were created especially to contribute to man's comfort, became equally his enemies, and contained within them each the means of his death. It was then that disease was born of *sin*, and commenced to lead the admiring victims of its parent to the matrimonial *altar of death*, and we have to-day the man of science going about in the world, reading upon the faces of men the bequests of a father, it

* We cannot let this paragraph go before our readers without a protest against the insertion of theological dogmas in scientific papers, and especially those statements that have been proven over and over again as inconsistent with accepted facts. Geology conclusively demonstrates that the world has run its course for millions of years, instead of the juvenile period so commonly quoted. We would not be considered as lacking in respect for the theological ideas of the past and present, but we have little regard for such teachings when they continue to inculcate views that science has so repeatedly demonstrated to be erroneous.—Ed.

may be one, or it may have been twenty generations back—cancerous in one, scrofulous in another, scorbutic in a third, and venereal in a fourth, the face being the index, the blood holding the contents. With all this poisonous material coursing through the circulation, depositing a tubercle here, destroying a secretory duct there, and exciting the absorbents elsewhere, disturbing the harmony that is so necessary to produce a proper man: surrounding us with the deaf, the dumb, the lame and blind, the dwarf and giant, the monster and the pigmy. Shall we, as a scientific profession, with all this evidence before us, declare to the world, that the maxillary bones alone have escaped deterioration, or, notwithstanding their shrunken condition from some one of the many causes, still insist upon their accommodating the original thirty-two teeth to the detriment of *teeth* and *features*, and with Dr. Atkinson declare, that “no one should be permitted to enter our ranks but such as are willing to put forth their powers in the saving of the six year molars;” or, with Dr. Fitch, that we “*never, absolutely never*, take out a tooth;” or, with Dr. Abbot, declare ourselves gods, and recreate the face of man, when we cannot cause even a little spear of grass to grow. Had we not far better leave the enthusiast to fondle his *hobbies*—this one to-day, another to-morrow—and, notwithstanding our boasted wisdom and learning, acknowledge our imperfections, inherent and cultivated, and accept nature as we find it in the mouth, then use our best judgment, conscientiously, in relieving distress and harmonizing deformities, instead of attempting to force her back to perfection in opposition to the very decree of *God*.

But I must leave, regretfully, this very interesting field of study, and hasten back to a closer acquaintance with my subject. And, in returning to the mouth, I am going to venture the assertion that, upon examination of the mouths of fifty persons at the age of thirty years, taking them as they occur in practice, there will not be found two with all the teeth present, and without any of the *evils* resulting from a crowded condition of the teeth. From the advocates of all the teeth being present, and who absolutely never extract a tooth, but in gimberjaw spread the jaw, and throw the teeth out over their already prominent neighbors, we have but two reasons given for the practice of which, if any man should fail to follow, he should be thrust out of the profession. They are, first, development of the jaw and face; and, second, the tipping forward of the tooth next to the one extracted. These two are all the reasons we have seen urged by those who advocate the absolute necessity of keeping all the teeth in the mouth. Of the evils resulting from all the teeth being present, or too many teeth for the jaws to accommodate comfortably, I am going to name—

1st. The irregularity of the six lower front teeth, representing something like the teeth of a saw, one tooth pointing inward, another outward,

going on alternately through the six teeth, and sometimes including the bicuspid, thus making it impossible for the patient, however much disposed, to keep them clean, and eventually, through the instrumentality of the deposit of tartar, before the age of forty, and sometimes thirty years,—if the teeth are strong enough to resist decay so long—they drop out of the mouth perfectly sound teeth, and that the same result, from the same cause, sometimes happens to the upper front teeth.

2d. The canine teeth, crowded outside of the arch and pressing downwards so hard as to decay the lateral incisor and first bicuspid in the effort to gain their proper place.

3d. The bicuspid, inside of the arch, and completely crowded out of their place.

4th. The wisdom teeth, or *dentes sapientiæ*, in some one of their many abnormal positions, either facing outward toward the cheek, inward toward the tongue, or forward, leaning hard against the second molar, or imperfectly developed, with three-fourths of the face of the tooth remaining covered with gum, which is always more or less sore, and occasionally giving rise to very serious consequences, or, it may be, never developed at all for want of room to appear in. Allow me to stop just here to say that I consider these various abnormal positions that the wisdom tooth is forced to assume, in the effort to gain its proper place in the jaw, is one of the strongest points in evidence of the deterioration of the jaw in size, and that nine out of every ten of the mouths to be met with in our country in the present day, would be bettered in every way by having one tooth less on the side of each jaw.

5th. The injury of all the teeth by decay and eventual loss, sometimes of the most important teeth in the mouth, and the attendant expense of doctoring and plugging all the cavities caused by the pressure of one tooth upon another. We have upon every tooth five surfaces for decay to attack—a labial and lingual surface, a grinding or cutting surface, and an anterior and posterior approximal surface—making in a mouth of thirty-two teeth, *sixty-four* approximal, to ninety-six other surfaces, that are equally exposed to the causes of decay, and I opine that, in a mouth where the thirty-two teeth are present at the age of twenty-five or thirty years, it will be found that the approximal cavities will be in the majority by one-third, over all the others combined. Is it necessary to indicate to any intelligent dentist present, who has had a few years of experience, the cause of, or the remedy that would have prevented this majority; and when we remember, too, that the greatest imperfections in the enamel of the teeth are always to be found in the fissures of the grinding surfaces of the molars, and upon the labial surfaces near the gums, two of the surfaces that are not approximal, does it not indicate that more room would

be productive of better results, and, whether the cause of decay upon these surfaces is to be attributed to the destruction of the enamel by pressure, or a defective deposit of enameling material, for want of room, it does not now become necessary for us to inquire, since the remedy in either case would be the same; but, that it is a fact that these cavities are in the majority, any one present may prove by the least particle of attention in his ordinary practice.

We have now presented five different forms of evil in the mouth, any one or all of which may result from a crowded denture. It remains for us to take some notice of the two points urged in favor of such a denture, and, first, we assert that if it is considered necessary for the future good of the mouth to extract the diseased six year molar, and if it is extracted at the right time, there will be no tipping forward of the second molar, certainly not enough to affect the mouth injuriously. This right time cannot be designated by naming the years of age of the patient, but will occur ordinarily about the eleventh or twelfth year, or just when the temporary teeth are all replaced by a perfect denture of the second set; and, until such replacement does occur, as a general rule every effort should be put forth to retain the six year molar. After such time, if it is found proper to extract the six year molar on account of disease, or for any other sufficient reason, the second molar which, as a rule, will not yet have appeared, will immediately take its place, and the six year molar will never be missed in the mouth, except by the dentist who is fond of filling approximal cavities.

The second point urged in favor of full dentures, viz: the development of the jaw bones and face, to my mind, *mars* more frequently than it makes the beauty of the face. I believe it is the testimony of scientific travelers that we, in North America, have the poorest teeth of all the civilized nations known; and it is from the same source that we have the assertion that in America we have more handsome faces than any other nation in the world. I do not by any means intend to argue that a dirty, neglected mouth, full of decayed teeth, adds to the beauty of the face, but on the contrary, it will make repulsive the most handsome face to be found. But I do believe that, in consequence of this frailty of the teeth of Americans, and want of development of the maxillary bones by nature, one or more of the side teeth are extracted on account of decay before the osseous system is completed, thereby allowing the maxillary bones to assume their proportionate size to the rest of the features, and softening it down to that harmony so necessary to produce a handsome face, instead of forcing it out until it makes the mouth the most prominent feature, and thus destroy the beauty of what would otherwise have been a handsome face. But as I have not the time now to trace out any one more of the many

evils resulting from this over-development, I will conclude this part of my subject by presenting you with the casts of two mouths, taken from my own work bench at home, neither of which was taken for this purpose, nor was it thought of when they were taken; but their silent eloquence will tell you more at a glance than I could explain to you by writing pages.

Now, gentlemen, if I have succeeded in establishing the fact that it may sometimes become absolutely necessary to extract a diseased tooth for the future welfare of the mouth, it remains for us, in conclusion, to determine which one might be the proper tooth. Beginning with the front of the mouth, we have first the six front teeth, none of which are to be considered for a moment in this connection. In passing backward in the mouth, we have next the two bicuspids, and these teeth I consider, after the wisdom teeth, the most frail and liable to decay, in addition to being the most difficult to save by filling, from the fact that the approximal cavities in these teeth most frequently extend themselves under the gums, and if they do not do so at the time of filling, the operator need not be surprised to find in a few years, unless the teeth are above mediocrity in texture, a cavity just above his filling, where, at the time of filling, he had left the bone perfectly sound. This unfortunate proclivity in these teeth brings them within the bounds of consideration, when we *must* extract for room, and if their neighbors, the six year molars, were perfectly sound, I would certainly agree with Dr. Harris, and take out a bicuspid tooth. I would determine between the two bicuspids, upon their indications as to proper position, good development, and probabilities of future decay.

One step more backward in the mouth and we come face to face with our long lost friend, the much lauded and much abused six year molar. Of this tooth, I am sorry to say, that in a majority of the little patients that I see in my practice, ranging between the ages of six and twelve years, I find the tooth decayed, and sometimes the nerve exposed even long before the temporary teeth are all shed. In such a case, considering, as I do, these six year molars sent so far in advance of all the other permanent teeth, for the express purpose of supporting the jaws, and masticating the food, and regulating the position of all the permanent teeth anterior to them during this shedding and replacement, *I do put forth all my powers to save them* until that is completed. But having been in the profession now nearly twenty years, and all this time in the same location, it follows that I am somewhat acquainted with the mouths and features, and pockets, too, of the parents of most of these children, and as I cannot now remember in all my practice one single patient, past thirty years of age, who has the thirty-two teeth present in the mouth, without some one of the injuries resulting from a crowded condition of the teeth, I confess that

I very rarely, where the nerve has to be destroyed, fill these teeth with gold.

Several reasons might be offered for this course in my practice, some of which I shall name. In the first place, there is not one person in every ten in a country practice that would pay nearly what one should have for the labor and expense of filling such a tooth with gold; and I cannot, nor do I feel it my duty to bestow my money, muscles and talents, (if I have any,) upon the community at large. I never could see the sense in sending away and offending a respectable person without doing anything for their relief, simply because you could not persuade them to invest ten, fifteen, twenty or *sixty* dollars in the tooth of a child, when it might be made comfortable at a much less expense, and saved, perhaps, as long as it might be needed. The physician might as well be found fault with, upon being called to see a *poor*, sick patient, and finding the best remedy would be a month at Bedford or Saratoga, for not giving the patient money enough to go there; and would he be excused for refusing to give any medicine at all because the patient felt too poor to obtain his favorite remedy? Or, would the dry goods man be considered sane who would send a lady customer away, that felt only able to buy a calico dress, because she would not buy a silk one?

Another reason is, that if the filling should become objectionable, or fail in any particular, or should the patient in growing up to manhood become rich or more liberal, and if it would be very desirable then to save the tooth for life, the objectionable filling could be removed and replaced with gold at any time thereafter.

The third and last reason I shall offer has already been indicated in many parts of this essay, and it is that in the future development of the child, after all the permanent teeth in the mouth anterior to the six year molars are fully developed, and if they are above mediocrity in composition, indicating the production of good wisdom teeth and a crowded denture, I might want to extract the six year molar that I have already deprived of life, and endeavor to develop fully thereby the wisdom teeth afterwards; for I want to remark in this connection what I have no doubt all present have seen, that the wisdom teeth are capable of very great improvement in their texture by giving them room enough to grow to their full size.

If I had not already so far exceeded the limits of an essay, I would like to have considered one more point in regard to these teeth in their relation to the wisdom teeth. At present I can only suggest a question: *are the wisdom and six year molar teeth both intended by nature to remain in the mouth through life?* or was the dentes sapientiae intended to fill up the jaw after the six year molar has been worn out by its herculean task of doing nearly all the work of the mouth from six up to twelve or four-

teen years of age, and the *dentes sapientiæ* not appearing until this tooth has served twelve of the most critical years in the mouth. I am not prepared to uphold such a theory, and I don't know that it could be sustained, nevertheless, it has in it apparently the rudiments of an argument, and may be worth a passing thought at your leisure.

In conclusion, I would assert positively that I am not the enemy of the six year molar, and I do regret, as sincerely as any one can, its loss; but, upon reading in the *Dental Cosmos* the discussions of the Brooklyn and New York Dental Societies, reported in the March and April numbers of volume six upon the six year molar, I considered them unreasonably radical upon the salvation of this tooth; that conviction led me to call it a hobby, and that hobby has led to the reflections that you have listened to to-day.

THE RUBBER SUITS IN PHILADELPHIA.

BY T. L. BUCKINGHAM, D. D. S.

In the July number of the *DENTAL TIMES* I published a short article on the above subject. I thought that a statement of the management of these suits, and their termination, would be of interest to the readers of the *TIMES*; and, as at the time the article was written there appeared to be no prospect of a report from the committee having charge of these suits, I took it upon myself to state such facts as I had in my possession, and, in doing so, I endeavored to avoid all that would appear like censuring any of the parties, and simply state the facts in as mild language as I could command.

But it appears that I have failed, and I have either said too much or too little; for a correspondent of the *Cosmos* (Henry Coy) has written a reply, which, coming to hand too late for the August number, was published in pamphlet form, so as to be distributed at the National Association, and now appears in the September number of that journal. I would not make a reply to this long article, had not the author stated that at a meeting, held July 3d, I had made retraction from what I had published; and he puts great force on the fact that I presided at that meeting. Does he know that the chairman of the committee, Dr. S. S. White, sent to my office a special request that I should preside, and when at the meeting I proposed to him to nominate some other person, he said as I had presided when the committee was appointed, he thought I should act, and hear the report? This would be of very little account, only he wishes to convey the impression that, as I presided, I endorsed all the committee had done, and, as for the retractions, he has failed to state them. He does make me say, "that he wrote off-hand and in haste to save himself the trouble of replying to the letters of numerous correspondents, and fervently dis-

claimed any intention to censure anybody," and then holds his hands up and exclaims: "My readers have, by contrasting the article and his retraction, the means of estimating Dr. B. and his 'Rubber Suits!'" If this was retracting, I must acknowledge that I said what is stated. I did not intend, in writing the article, to censure any one, and to avoid doing so, caused me to write very carefully—for the whole transaction is so susceptible of an ugly coloring, that to avoid it and tell the truth, required great care. But I did not write off-hand nor in haste; I had ample time to prepare my article, and corrected the proof after it was set up, and, from a careful review of it since, I can discover nothing to retract.

But this reply has brought to light some things that were before in the dark. We always thought there was some influence acting on the case that was not visible, and now Mr. Coy informs us who this controlling spirit was. In reference to the abandoning this organization and adopting the form it took, he says: "Happening to see some of the parties engaged in forming the constitution and other machinery of the association, I was so impertinent—being myself out of practice, and therefore out of the fight—as to seek the gentleman who had been named as chairman of the committee on organization, and urge upon him the impolicy of following the Boston and New York Association plan. I so far impressed him with the reasons for dropping the society form and adopting that of a simple club of resistant and aiding subscribers, that he presented these reasons, with his own, to those of the proposed association whom he could see, and thus its form was modified." If we are not mistaken, this form was presented to the organization in Mr. Coy's own hand-writing,* by the chairman of the committee, who stated if it was adopted, he was willing to act with them, but if not, he would still pay his subscription, but would decline having anything to do with the case, and he was considered to be of so much importance that he was allowed to have everything his own way.

And then he tells us: "My connection with the defence began after Furman Sheppard, Esq., had been secured by the committee as counsel. Previous to this, I had consulted in a friendly way with the president of the committee, and had aided to induce Mr. S. to accept \$500 as a retainer in these cases, which was *about all the funds collected at the time.*" (These italics we have put in.) "Mr. Sheppard was clearly of opinion that he would not be doing justice to himself by accepting less than double that amount in two important patent suits for a company of individuals. Having been for a great many years a client of Mr. S., I had influence with

* I may be mistaken about the form being in Mr. Coy's hand-writing. I have twice written to the chairman of the committee who, I have been informed, has it and the report of the committee, but I cannot obtain either.

him to get him to accept half his proper retaining fee, and afterwards to do much more than a retainer pledged him to do." And Mr. Coy being himself out of practice, and when another \$500 was collected, he *reluctantly* accepted it as a retainer, although he did not believe there was any prospect of *our* gaining the case.

I must acknowledge that I do not know how much a lawyer agrees to do when he is only paid \$500 as a retainer. If this is only to retain him from going over to the other party, and he expects the principal fee to come afterwards in each individual case, then I think we had better settle with the company at \$50 a year. And now that we have established Mr. Coy—or rather, that he has established himself the advisor and controller of this committee—let us examine some of his "statements, inferences and deductions."

First, his reasons for changing the organization from an association to a club. The association, as shown by a preamble and constitution, which was proposed, but does not appear to have been adopted—for at the meeting when the organization was expected to have been completed, the proposition to change it to the other form was made and carried—so that the minutes are in about as much confusion as the meeting was when the change was made—was to be merely a combination of persons who paid into the treasury a sum of \$20 to test the validity of the hard rubber patent; and they agreed to employ counsel to defend, to the extent of their means, any one of the members who might be prosecuted. The management was to be given into the hands of an advisory committee, who was to have power to employ counsel and attend to such other business as might require their attention, and this committee was expected to report at such times as the officers might call the members together. Now, what are his reasons for changing this form, which "may now be told without injury. In a suit at law or in equity the sympathy of the judge and jury should be propitiated and secured if possible. In these suits the prosecution was made by a chartered company—a mere moneyed corporation. The defendants, on the record, were individual dentists." "It was desirable to set aside all proof of an association indicating joint stock resistance, and, while not denying that they were aided in the defence, to preserve such a show of individuality as would make all the sympathy of contrast between strength and apparent weakness belong to the side of the dentists." Another reason was, "that a defence conducted by a society which had stated meetings must not be exposed by reports." And this was, probably, the principal reason, for it is certain the committee made no report till nearly three months after an injunction had been granted. And the court is to be made to believe that these are individual suits against poor dentists, brought by a rich monopoly. Would it not have

been as well to have made Mr. Sheppard and Mr. Coy believe the same thing? and then, perhaps, the retaining fees would have been less. And, again, "the sympathy of the judge should be propitiated and secured if possible." We thought in cases of this kind the court would decide impartially, according to the evidence before them. But as Mr. Coy thinks these are reasons good, we can only submit them to the judgment of our readers to decide for themselves, as they are as much interested as we are.

But let us pass to another point he makes in his article: "I doubt the correctness of his statement, that they (the committee) 'collected funds with the understanding that they would defend any one who subscribed, until at least one case had been decided by the court.'

"How could the committee undertake to do any more than faithfully administer, in the line of defence, the money entrusted to them? But no authority can be found for the statement made by the doctor, as above, that for any dentist's five or fifty dollars, they would insure him against Josiah Bacon and his satellites. I think a statement more nearly true would be made thus:

"'The Goodyear and Cummings party have sued a number of dentists. Personally, they are unable to defend a patent suit of such magnitude. We are a committee chosen to collect subscriptions to defend them. By aiding them you may save yourself. Unless we do it thus, all will go by default.'

"I also am informed that the money was subscribed expressly to begin a defence against the suits already started, without any pledge or responsibility at all. Moreover, a large portion was given by dealers in dental goods, who had incurred no liability."

The above quotations contain the principal points in dispute, *i. e.*, the object for which the fund was collected, and the manner in which it was used. Mr. Coy endeavors to make us believe that the fund was collected to defend those against whom suits had been already commenced. If this was so, would not it have been cheaper to have purchased their licenses of \$50 each, than to pay \$1,000 to retain counsel to defend them? And how were we to defend ourselves by aiding them, unless it was that one case tried in court would decide the whole. We all knew that there would be but one case tried, and that must be against some one individual, and it was no difference who he was; neither was it any more trouble for the counsel to defend one than another. One case in New York decided the whole, and Judge Nelson would not hear another, unless it could be shown that additional testimony could be produced. It would be a burlesque for the judge to hear the same testimony and the same

arguments repeated in fifty different cases. Oh, no, Mr. Coy knows better than that!

But, dentists who live out of the State offered to subscribe to the fund and were told as they were out of the judicial district they could not be defended. And at the July meeting, when the committee made their final report, the chairman offered a resolution, which was adopted, to return a subscription to a party who lived in another State, as his case could not have been defended. "How could the committee undertake to do more than faithfully administer, in the line of defence, the money entrusted to them." "But no authority can be found for the statement made by the doctor as above, that for any dentist's five or fifty dollars, they would insure him against Josiah Bacon and his satellites." No man expected the committee to do more than the means placed in their hands would enable them to do; but when these means were exhausted they should have called the subscribers together and reported to them the state of the case, and then if they had refused to furnish them more means, the committee could have declined having anything more to do with the case, and nobody could have found fault. When Mr. Sheppard intimated to me, in February, that he would expect another fee if he went on with the cases, I immediately wrote a note to Dr. S. S. White, stating the fact to him, and when I next saw Mr. Sheppard, in May, he told me he had not seen any one connected with our side of the case since I called on him in February. We were led to believe that an injunction would not be obtained without our knowing it. The show of resistance, which the writer speaks of in another place, was kept up a little too long.

"We come now clearly to the main statement of the doctor which has provoked this reply.

"The lawyer or the assistant, I do not know which—it probably took both—wrote out an answer and had it printed, leaving blanks so that it would answer for all cases that might come up, which was handed into court in reply to the cases then commenced."

"Thus, at 'one swing around the circle,' this veracious historian relates what he did not know, belittles what he did know, and either falsifies what he knew, or undertakes to relate that of which he was not informed."

And then he makes allusion to "wholesale detraction of persons he has no acquaintance with," and about Dr. B. being "a ruler in the synagogue, a teacher of others," and "a magazine like the DENTAL TIMES, published under the sanction of the faculty of one of the leading colleges of dentistry in the world," and then he winds up by saying: "I assert that neither the lawyer or assistant—or 'both of them'—can be accredited with having produced those answers. They are the valuable concrete result of the study and skill of all the lawyers and assistants who have been employed

in all the defences against all the suits which the hard rubber men have prosecuted, from Toland's down."

Well, this short sentence of mine appears to have provoked Mr. Coy more than anything else in my article. What did I say? "*The lawyer or the assistant, I do not know which—it probably took both—wrote out an answer.*" And now he informs us that "they are the valuable concrete result of the study and skill of all the lawyers and assistants who have been employed in the defences." Then I suppose he is offended because we did not give the others who had been engaged in perfecting this answer credit for their share. If that is so, we do now most humbly beg their pardon, while we frankly confess that we are not able to value these concentrated distillations from the craniums of lawyers and their assistants. This answer may be all that could be required; it may present such forcible arguments that the judge, if he had heard it, would have dismissed the case without any other evidence—but what use was it to us? We had nobody to present it; we were led to believe that it would be presented, and therefore we rested quietly; but when the time came to hear the case there was nobody to present this "*answer.*"

And then he says: "We framed an answer in such a way as we thought would best serve to make the prosecution believe we meant a full defence, and intended to stand a trial here." It appears from this that the answer was intended for a sham, and yet they had a hundred copies of each answer printed. Now, without attempting to examine this answer, which has been perfected by so many wise men—for we have admitted that we were not competent to do so—still there appears to us something requiring further explanation, when considered in connection with the article in the *Cosmos*. These answers set forth that for a number of reasons they believe that the patents are invalid, and in Cummings' case, that a number of persons had used rubber in dentistry before he applied for his patent, and names these persons; and also, that the process had been described in various public works, and gives the names and dates of these publications; and yet Mr. Coy says: "I said then, and I have too frequently been obliged to say since, that I was unable to find anything on which we could make a safe stand against these patents in court." And, in another place: "My *study* of the *case* revealed the fact that for us in Philadelphia there did not exist an available defence." Is it possible that they drew up a set of answers in which they had no confidence, and made statements that they knew could not be verified, and required their clients to swear to them? Is it then strange that in one of the cases they had on hand, they found much difficulty in getting the defendant to swear to and sign these answers?

But I must not stop to examine the discrepancies further, for I find my

article is getting much longer than I intended it should be. There are still one or two points I want to notice before I close. Mr. Coy, in one or two paragraphs, tried to divert the attention of the reader from the points at issue, by alluding to my conversation with Mr. Sheppard, and my visit to the office of the counsel of the Dental Vulcanite Company. Well, what if I did visit the company's counsel, or was undecided whether I would defend or settle my case, could it change their position in any way? It was not my case alone they were trying—it was a suit against all those who had contributed; and if I had settled, they would have been bound, according to my view of the case, to take the next one that came up. But Mr. Sheppard was not left in doubt in regard to my course; the note which I carried to him from the chairman of the committee informed him that I was a subscriber to the fund, and I stated to him that my individual case would not justify me in feeling counsel to defend it, but I was there as a representative of the dentists, and that I would request Dr. S. S. White to see him in reference to additional fees.

As to my visits to the company's counsel's office. I was there twice; the first time before I saw Mr. Sheppard—on the day after I received notice to appear at court—when I called upon Mr. Harding, with whom I was acquainted, and asked him how I could settle the case without going to court. He told me if I would confess an injunction he thought I would have no trouble in settling. This I refused to do, as they would use the injunction to make others pay. The second visit I paid to the company's counsel was by request of Mr. Sheppard, on the day the case was to be heard in court; Mr. S. requested me to go and see when Mr. Harding would be in court. I called at Mr. H.'s office and found he had gone to court, and then returned to Mr. Sheppard's office, informed him, and then we walked to the court room together. We were in the room more than an hour, waiting for some cases to be disposed of. During the greater part of this time I sat in the back part of the room conversing with Mr. Griffin, the company's agent, and perhaps this is what Mr. Coy has reference to—but he has got it a little confused.

As for Mr. Sheppard seeing me for over half an hour at the office of the counsel of the Dental Vulcanite Company, there must be some mistake about this. In the first place, I was never in the office over ten minutes at one time; and then, as Mr. S.'s office is more than a square off, and in another street, so that it is impossible to see from one to the other, Mr. S. could not see me enter the other office from his, and he would hardly stand in the street for over half an hour to watch me; but this is a matter of very little account. As well might we accuse Dr. S. S. W. of being in collusion with Mr. Harding when he rode over to New York with him in the cars, and talked with him about the rubber suits, or Mr. Sheppard

and Mr. Harding of combining to defraud the dentists, as to say, because I conversed with the opposite counsel, I intended to sell out the case to them.

Another point which Mr. Coy lays great stress upon is this, "we had done more with our means, and by Mr. Sheppard's influence, than had been done in New York with ten times the money;" and in another place, "with small means we gained double the time which New York was able to secure at a large cost, with a trial resulting adversely. Not a little of this credit is due to Mr. Sheppard's generalship. The character, wealth and integrity of the committee aided it." Now, allow us to ask, what did they gain? Nothing, so far as we know, unless they think it was to the advantage of the dentists to put off settling with the Rubber Company for sometime over a year. But the chairman of the committee knows, if Mr. Coy does not, that at the time the Rubber Company first commenced suit against the dentists of Philadelphia they were settling with those who would settle on almost any terms. Cases are reported of dentists who were doing a large amount of this work settling with the agent for a very small sum, and he agreeing to deduct annually a portion of this, so that by the time the patent would expire they would have the whole of the amount they had paid returned to them; but what terms were offered after the injunction was obtained? We were required to make out an account of all cases made from May, 1865, to January 1st, 1868, for which they charged a royalty of \$2.50 on each case which had over six teeth, and \$1 for each case of six or less teeth. Beside this, we were required to pay all the costs on the writs; and these terms, I believe, they have exacted from all who have settled since the injunction was granted; and beside this, the lowest price they would grant a license for the year 1868 was \$55. My readers have, by contrasting Mr. Coy's statement with the above terms, the means of estimating the advantage the dentists have gained by deferring the settlement.

But I must close. My article has extended to a much greater length than I intended when I commenced; but before I do so, allow me to present the subject in a few sentences as I view it. There were \$1,100 collected here to defend the dentists against the Rubber Company. This sum was placed in the hands of the committee, the chairman of which selected a lawyer and an assistant. They were paid \$500 each. A paper, as an answer, was drawn up and printed at the expense of the committee, and handed in to the court in the three or four cases which were first commenced, and when suits were brought against other dentists, the lawyer refused to even hand this answer in until he had been paid another fee. The chairman of the committee was notified of this fact, and from some cause, which has not been explained, no defence was made, and an injunc-

tion was granted. Very nearly three months afterward the committee called the subscribers together, and stated these facts to them, and asked to be relieved from any further acting in the case. To say that the subscribers were satisfied with the actions of the committee is not correct, for some of them stated there that they intended to test the case further, and have since employed counsel, and these cases are now pending in court.

But the worst feature of the case is not presented yet. The action of the committee has had such a *demoralizing* effect upon the dentists that I doubt if a hundred dollars could now be collected here to test any case, and I presume if the Rubber Company does not grind the dentist down too hard, there will be no other combined defence made in Philadelphia.

GERMAN vs. AMERICAN DENTISTRY.

BY JAMES TRUMAN, D. D. S.

I find in the July number of the *Deutsche Vierteljahrsschrift* the following pointed remarks upon American dentistry. They were called forth by a discussion that occurred at the Illinois Dental Convention, held in Chicago, May 14, 1867, between Dr. Preebles and Dr. Watt. The former contended that a specialty could not be separated from the principal school of instruction, but should be kept as an integral part of the science of which it is a member. Dr. W., in reply, stated that the dental colleges of America had done more for the elevation of dental science in a few years than the medical schools during centuries. To this the editor of the German quarterly critically remarks that,

“It is true that the accomplishments of these American institutions are important, and we at this distance certainly acknowledge it gratefully, that we have learned much from our trans-Atlantic colleagues; but Dr. Watt is not quite right when he also extends these accomplishments to dentistry as a science. By virtue of their colleges and associations, the Americans are more advanced in practical and mechanical respects, and it is *only in* these departments that we have learned from them. In little or nothing is dental *science* benefited by them. England and Germany occupy, in reference to science, the same position toward America as America has acquired toward us in the more mechanical and manual branches of dentistry. But while we are anxious to secure every new improvement that may be offered us from the other side of the ocean, our selections from all the foreign journals give the best proof, which we regret to see, that the scientific attainments of Germany especially are there systematically overlooked. The works of Albrecht, Wedl, Neumann, Waldeyer, Hertz, and many others are not noticed with one word in the American journals, while their articles which contain scientific questions rarely ever stimulate to new observations, and do not evidence the result of exact investigations.

“It is true we still need many things before it will be perfect with us. Beside the opportunities of a classical school and university education, it would satisfy our desires if the Government would, according to the petitions of the Central Association, grant the means for the practical education of our young students to become able specialists, *i. e.*, dentists; but what the Americans require is, not *one-half* or *one-quarter*, but an appreciation of the importance of a *full*

scientific education for dental practice. Their leading institutions for education in operative and mechanical dentistry fail to have a scientific foundation. It is just this which changes the dental practitioner into a dental physician, and by which his social position can only be elevated. The thorough scientific education, combined with superior mechanical ability, by mutually completing and supporting each other, are the conditions which make the real good dentist."

While there is much truth in the criticism of our contemporary, we think the case very much overstated. That there is a marked difference in the thoroughness in both medical and dental education, between this country and Europe, we presume no intelligent observer will deny. The fact has long been recognized, and efforts have been made and are being made constantly to advance the standard of education in both departments.

We are more than willing to acknowledge our indebtedness to the investigations of the able men of Germany and England; but we were not aware that more than a small minority of these could be classed among the practitioners of dentistry. Upon this side of the ocean dentistry has ever been regarded as a distinct profession, neither claiming or being claimed as a specialty in medicine. Hence, while we gladly receive instruction in the several departments of science from our superiors among our medical brethren, we in no wise claim their discoveries as part of our professional work.

We acknowledge with reverent gratitude all that we owe to the brilliant intellects of the past and present in Germany, England and France. We in this country never fail to acknowledge without reservation their great superiority in certain directions; but, while we unhesitatingly admit this, we are not willing to undervalue the work of many illustrious men in this country, the names of whom may never have seen the light on the other side of the water. The advantages of centuries of gradual growth are all on the side of European civilization. It cannot, it ought not to be supposed that a nation could leap from the wilderness to the full station of European intelligence in the course of two centuries. Hence, we on this side can have no reasonable controversy with the criticism of our German friend, except that it is too sweeping in character. As a nation, we are not given to live in the speculative. A theory that cannot be coined into use in the practical affairs of life is not respected. The men of mere ideas are not held in that veneration that a better civilization in Europe gives them. As fast as science enters and improves the practical details of human affairs, just so soon does it enter into the hearts of American men, and not much faster. Of course, this is the extreme view, for there are hosts of devoted men and women who are working out their lives, unknown and unnoticed, adding by their labors to the great wealth of facts that make this day and hour so much in advance of all the past in all countries.

It must be acknowledged, I think, that the people of this country do not lack originality. This is possessed in abundance, and has been amply demonstrated in our profession. Their natural temperament may lead, and probably has led, much of this talent in entirely different directions from that which would satisfy the taste of a German investigator, but it may, nevertheless, be equally or even more valuable in results.

Our critic is seriously in error when he asserts that "the scientific accomplishments of Germany are systematically overlooked and not noticed." The assertion evidences a want of familiarity with the prevailing feeling in this country among all classes. We venerate Germany, her literature, her science, her advanced steps in liberal ideas, as we venerate no other nationality in Europe. The names of her great men are familiar as household words wherever original thought is appreciated in any department, and he who would dare assert to the contrary would be justly considered unfit to enter the arena of intelligent criticism.

We frankly acknowledge that dental journalism in this country is by no means up to the standard that most of us have marked out as our ideal; but, while acknowledging this freely, we feel at liberty to say that it is quite equal to the ability displayed in more pretentious quarters. Europeans will persistently misjudge us by not properly taking into consideration the conditions with which we are surrounded. The professions in Europe are amply protected by laws. They are fostered in every way by government. So stringent are they in Germany that it is next to impossible for an ignorant man to enter the ranks of any of them. Now, how is it with us? Until within the past year not a single law existed on any statute-book, regulating dentistry, of any of the States of the Republic, and even at the present writing but two have adopted them. The result has been, that probably nine-tenths of the practicing dentists of this country have had their education in the private office and laboratory. There has been nothing to prevent the unprincipled quack from entering practice, except that improving sentiment, which of latter years has discountenanced any new additions, unless properly instructed. The struggle from this chaos of ignorance has been a hard one. No sudden transition was possible, but each step was necessarily taken in painful efforts by those who led the advanced thought in the profession, amidst constant discouragements.

Is it surprising, then, that the largest proportion of the ten thousand persons practicing dentistry in this country should demand in their journals only such matter as would advance them to a higher practical standpoint, or that the journals should, to a large degree, cater to this desire, under the belief that time would develop a higher appreciation of stronger intellectual food? Whether this is right or wrong on the part of the con-

ductors of dental journals, it is certainly true that the scientific questions that are occasionally discussed find but few appreciative readers, and, hence, but little effort is made by those interested in the solution of difficult problems in science to bring the result of these investigations before the public through this channel. Were we to judge of German dentistry by the same standard, it would not be difficult to make out a good case against them, not only in practical matters, but even in scientific accuracy. But there is no disposition to be discourteous; as the question under discussion is one of serious interest to us at the present moment, and, therefore, all friendly criticism is valuable in that, that it stirs the mind to a rigid self-examination.

While there is, therefore, much apparent truth in the rather caustic remark in regard to the articles published, it by no means proves the condition of dental education in this country. Our colleague exhibits a want of information in regard to this that is rather surprising. That any one should assert in a public journal that our "leading institutions for the education in operative and mechanical dentistry fail to have a scientific foundation," is certainly beyond comprehension. We are perfectly aware and painfully cognizant of our deficiencies in many particulars, but it cannot be controverted that the effort is made, and in the main successfully, to inculcate in the most thorough manner all that pertains to dental science. By this I mean thoroughness in each of the branches of chemistry, physiology, anatomy, dental pathology, therapeutics and surgery. General pathology and surgery, I believe, can never be taught properly in a dental school, and in this lies the greatest defect of our system of dental education; but I am aware of no good reason why all the remaining chairs may not all be equally as well demonstrated in a dental as a medical school.

Appreciating this defect, the effort has been made in several instances to attach a corps of dental instructors to medical institutions, the most notable of which is the recent election of dental professors in the Harvard University of Cambridge. There are, however, practical difficulties in the way of such arrangements, that I fear will militate against ultimate success. We believe that the object of all education to be to lay the groundwork correct in all that will ultimately tend to the greatest benefit to the educated. It is not to be presumed that a student can acquire a thorough knowledge of *all* that is brought to his attention. To expect him to accomplish the whole circle of the sciences before he could be considered fit to practice, would be to extend the period of study over a longer life than is afforded to most of us, to effect a graduation.

The idea has long been erroneously entertained that a thorough medical education is a sufficient base to commence dental practice. A greater error could not be committed. This fact has been demonstrated over and

over again in the experiences of the dental colleges of this country. Students have repeatedly sought the instruction of these schools from this country and Europe, thoroughly grounded in scientific attainments, and who have proved wholly inefficient in all the practical details. In a word, incompetency in manipulating has prevented them from ever occupying even a respectable position among their colleagues, or ability to gain the confidence of their patients. While it would be a matter of regret to have any department advance at the sacrifice of any other, it must be apparent to any reflecting observer that the greatest benefit will accrue to suffering humanity, if our students are trained in the manipulative branches more thoroughly than in collateral subjects.

Acting upon this theory in the past, the result has been that American dentistry to-day stands preëminent in the operative and mechanical departments. The science of France, Germany and England has yet failed to compete with us in any particular. The rapid progress toward perfection in these two branches is almost entirely due to the efforts, intelligently directed, of the dentists of this country. We on this side owe little or nothing to foreign nations for any practical ideas. In the manufacture of the materials we use, America again takes the lead; in fact, if we are to judge by the immense quantities of American material exported, scientific excellence has availed them but little, where they should exhibit the greatest proficiency. With no desire to arrogate to ourselves more than properly belongs to us, it must be conceded that the practical skill of American dentists is a constant reproach to our colleagues in Europe.

This fact furnishes the key to unlock the reason why we, as a profession in America, have not advanced as fast nor as far as our critic thinks we should. The Germans have their scientific schools and universities, the heir-looms of centuries. Satisfied with the science acquired at these institutions, they have neglected, to a large extent, that which would be a greater benefit to their patients—practical excellence. On the other hand, we have spent our half century in laying the foundation, in perfecting the manipulative details of practice. It seems to me the time has now come to dentistry in this country when the superstructure should be reared and dedicated to pure science.

I most cordially agree with our co-laborer on the other side, that it is only by cultivating the mind in every direction that the dentist can hope to be qualified to be the fit associate of men of enlarged scientific attainments. It is to be hoped that this great truth will eventually come to be a cardinal principle of action in this country, as I believe it is in Germany and England.

Dentists of America, the work is an individual one, and if you fail to

appreciate its importance at the present time, the dentists of the Old World will step on from the point you have reached, and the preëminence, so hardly earned, will be taken from you for ever. When any branch of human endeavor has attained nearly to perfection, it is enervating, nay more, it is mental suicide, to devote so large a portion of effort to its further advancement. In this condition I view the present status of American dentistry. We have earned our laurels in operative dentistry and dental mechanism, now let us cultivate these enlarged aspirations to solve the unknown, to clear up the mysteries of nature in all her departments, to make part of our intellectual natures the great works of the mental toilers the world over. With this determination ever in the ascendant, the union of science with practical skill will have been accomplished, and we can fraternally shake hands across the blue waters with our co-workers in Germany and England, equal in all respects and inferior in nothing.

MANUFACTURE OF GOLD FOIL.

(Continued.)

BY W. H. EAKINS.

Pure gold is of a rich reddish-yellow color and high metallic lustre; in the pulverent state it is a dull brown, but acquires the metallic lustre by friction or pressure. Finely divided gold, precipitated by sulphate of iron, is found to vary in density, the maximum 20.72, and when precipitated by oxalic acid, its density is 19.48; and such is its malleability that it may be hammered out into leaves one three hundred and seventy thousandth of an inch in thickness. A single grain may be extended over seventy-five square inches of surface, or be drawn out into a wire five hundred feet long. Pure gold does not combine directly with oxygen, and therefore suffers no change by exposure or moisture, except in its adhesiveness, at any temperature, not even by being kept in a state of fusion in open vessels. It is not attacked by any of the mineral or any of the simple acids except selenic, and this only by the aid of heat. The alkalies do not affect it, but it is dissolved by any substance which will liberate chlorine. It is therefore dissolved by hydrochloric acid, if binoxid of manganese or chromic acid, &c., be added to it. Its usual solvent, already stated, is a mixture of one part nitric and 3 or 4 parts hydrochloric acids. The proper solvent of gold is nascent chlorine, which is eliminated by the mutual action of the mixed acids. Infusion gold exhibits a bluish-green color; it is not sensibly volatile in the strongest heat of a furnace. Gold contracts on cooling, and cannot be advantageously employed for castings as it shrinks greatly at the moment of solidifying.

When it is required to know whether gold has any alloy or not, we

must apply tests or re-agents, which may be done by a solution of the gold in aqua regia, then evaporated to about one-eighth and diluted considerably with distilled water. If a few crystals of sulphate of iron be dissolved in water and dropped into the solution, the result is the precipitation of the gold, as before described, insoluble in nitric, but readily soluble in aqua regia. If to another portion of the solution be added a small quantity of chloride of tin, there will be immediately produced a dark brownish-purple precipitate, giving a manifest reaction when this test is employed. Oxalic acid, either in crystals or dissolved in water, causes, when added to the solution, the precipitation of the gold in form of a brown or greenish-black powder in the same manner as the sulphate of iron, but the precipitation does not occur so rapidly. It requires not less than forty-eight hours for the whole of the gold to be thrown down by the oxalic acid unless heat is applied, by which the process is accelerated. A crystal of oxalic acid, wetted with the solution, becomes soon covered with a thin film of gold, having its distinctive color and lustre. The only metals that sulphate of iron precipitates are gold, palladium, silver and mercury. Other metals, like iridium and rhodium, not being dissolved, would precipitate in the acid solution by their greater specific gravity, from which, of course, the gold solution is decanted. Silver may be recognized by its chemical behavior to reagents, in which it differs from gold, from its ready solubility in nitric acid and in boiling sulphuric acid. On the contrary, with hydrochloric acid, it forms a white curdy precipitate, which is the chloride of silver; hence, when gold containing silver is dissolved in aqua regia, the appearance of this white precipitate will immediately indicate the presence of the latter metal or lead, which may be dissolved out of the silver by its ready solubility in warm water.

One of the readiest tests for copper is to introduce into the solution a piece of clean iron, when, if copper be present, it will be deposited on the iron in the metallic state by chemical affinity. When ammonia is added in excess to the solution, if copper exists there, it communicates to the liquor a rich, deep blue color. Ferrocyanide of potassium (yellow prussiate of potash) produces a brownish-red precipitate, even when the metal is present in a very small quantity. Carbonate of soda precipitates copper from its hot solution, in the form of an apple-green precipitate, which is the carbonate of copper. Where platina is associated with gold and dissolved at a temperature above 200° , it has dissolved along with it sulphate of iron and oxalic acid, which precipitates gold, but does not precipitate platinum.

As the process of gold foil beating is purely a mechanical operation, involving important applications of the noble metal, it will be necessary to give a short account of the process. The gold is melted in a crucible at

a higher temperature than is simply necessary to fuse it, by which the malleability is improved. It is then poured into moulds previously heated and slightly oiled on the inside, and cast into flat oblong ingots, each about an inch wide, one-fourth of an inch thick, and four, six and eight inches in length. The ingots are then taken from the moulds and annealed, and to clean them from grease they are plunged into a weak solution of sulphuric acid. When the ingot is cold, the French gold-beaters hammer it out to the thickness of one-sixth of an inch, and expose it at the same time to repeated annealings, but this operation (termed forging) is omitted in the United States and England. The next process is the lamination, which consists in repeatedly passing the ingot between two polished steel rollers, gradually brought closer together, until it is formed into a ribbon of one inch in width, and of the required thickness—the length depending upon the number of ounces of gold in the ingot. The gold is annealed after each lamination. The next operation is the beating. The ribbon is carefully divided with a pair of compasses, and cut up in pieces the size of an inch square, each weighing from five to thirty-five grains; about two hundred or two hundred and fifty of these are placed, by means of wooden pincers, between the leaves of a cutch, which formerly consisted of a packet of fine calf skin vellum, but it is now usual to employ a tough paper manufactured in France, called French paper. A case of strong parchment, or vellum, open at both ends, is drawn over the cutch, and this is enclosed by another of the same kind drawn over it, at right angles to the first, so as to cover the edges which the first had left exposed. The cutch is then beaten with a twelve to sixteen pound hammer, upon a smooth block of hard marble, supported on a strong bench or post, and surrounded on three sides by a wooden ledge, the front being left open, with a leathern apron attached to it, to preserve any gold that may fall from the packet in the process of beating. The hammer is short handled, and is wielded by the beater with one hand, while with the other the packet is continually turned over to distribute the force equally. The elasticity of the packet causes the hammer to rebound and lightens the labor of the operator. At intervals the packet is taken up and bent or rolled between the hands to overcome any slight adhesion between the leaves and the interposed paper, or, it is taken to pieces to examine the state of, and to shift the central leaves to the outside, and *vice versa*.

When the gold plates of an inch square are beaten out into about three and one-half inches square, or to nearly the size of the leaves of the cutch, which generally requires about twenty minutes beating, the packet is opened and each leaf of gold is taken out and put into another packet, made of the same material, but larger than the first. The shoder, as it is called, is enclosed in parchment or vellum as before, and beaten till the

squares of gold are about the size of the skin, it requiring about thirty minutes beating for the operation. During this period the packet must be often folded to render the gold as loose as possible between the paper. After the last beating, the leaves are lifted one by one by a pair of long pincers, made of white, or box wood, and the gold is spread out on a leathern cushion. Broken and blemished leaves are rejected. The good ones have the ragged edges cut off with a square frame of sharp cane called a wagon, which reduces them to a uniform size. Afterwards each sheet is annealed, weighed and placed between the leaves of a book. The numbers of foil run from three to ten; those generally used in this country are Nos. 4, 5 and 6—these numbers indicate the number of grains in the leaf of foil. No. 4 contains four grains; No. 6, six grains; No. 10, ten grains to the leaf of foil. To find the number of sheets in a book, divide the number of foil by the number of grains in the book, which is sixty grains, or two and one-half dwts., or one-eighth oz.

Latterly machinery has been applied to supersede the arduous manual labor of gold beating with the hammer, and machines for this purpose have been built, but, I believe, with not much success; there is little doubt but that gold foil and leaf so manufactured, will ultimately supersede the product of manual labor.

HARDENING AND TEMPERING.

BY CHAS. A. BLAKE.

A great deal has been written and said on the subject of tempering, but as far as I have seen, nothing of a really useful or practical nature to the dentist or student has yet appeared.

In the February, 1868, number of the *Dental Cosmos* there is an article on the subject of Hardening and Tempering, in which the writer rather mystifies than explains the matter. After an *attempt* at the “atomic theory”—of which, by the way, very little is known—he tells us: “after it has been heated to redness and plunged into cold water, by subjecting it to a heat of 430 deg., we produce first a pale yellow, which, with the increase of heat, changes to various shades of straw color, thence to several tints of purple and blue, until at 630 deg. we reach a pale blue with a green tinge.”

In a scientific point of view, the known degrees of heat necessary to produce certain results in tempering are all very well, but how is the student or dentist to measure those degrees of heat knowingly?

Many dentists possess very crude ideas on the subject, some of which are quite curious, *e. g.*, on one occasion an old practitioner very gravely told me that *he* always hardened *before* tempering his instruments, as he considered it *much* the best way.

We frequently hear members of the profession say, "they can get along with everything but *tempering*," really the most simple of all operations they have to perform outside of the operating room; although there are many who would mislead them, by trying to invest it with unnecessary difficulties or secrecy.

To begin, then : in the first place, we all know there are two kinds of steel—good and bad ; of the latter little need be said, except—discard it altogether. But some will say, how am I to distinguish the bad from the good ? This may be done by breaking a piece of steel and examining it ; if the fracture presents a coarse, glittering appearance, do not use it. If the steel is good, the fracture shows a fine, *close* grain, of a grayish-white color, the *whiter* the better, if the grain is fine.

The finer the steel, the lower the heat required to harden it ; but the finest steel will gradually lose its quality by repeated hardening. It is improved by being well hammered at a low *red* heat, each time before hardening.

If the instrument to be treated is an excavator, it must first be annealed, or softened ; this is done best in a spirit or other lamp, such as that used in the laboratory. Hold the part to be softened in the flame till a red heat is barely visible, then let it cool slowly. When ready to handle, file the point to the required form ; then heat it in the flame till it assumes a bright red heat, but not sufficient to cause it to *sweat* or blister, taking care that the *point* does not get too hot before the shank of the instrument is ready ; the red heat should extend about an inch from the point. When sufficiently hot, cool it suddenly in cold water ; if the water is slightly acidulated it is somewhat improved, but this is not absolutely necessary.

Next, carefully rub the part hardened on a piece of fine emory paper, or anything that will make it bright. Having brightened it, hold the shank of the instrument in the flame of a *spirit* lamp till the thickest portion of the part hardened becomes blue, gradually drawing it through the flame towards the point, which should be held on some cold substance, to prevent it from becoming blue. Allow the shank to become blue all along to the bend ; the blade will now be straw color, at which time cool it in water. The blue color of the shank leaves it about hard spring temper, which will resist any lateral pressure, while the blade, if left dark straw color, will be sufficiently hard to cut. It is now ready for polishing, of which I will speak hereafter.

We will now take a plugger—having softened it, file and bend it to the required form, then polish the point smooth and serrate according to its requirements ; this should be done with a very fine, sharp-edged, triangular file. Heat to the same degree of redness as for an excavator, plunge it into cold water, rub bright as before ; then hold the shank in the flame

until blue, gradually drawing it toward the point, the slower the better, allowing the point to become a reddish-purple, verging on a blue tint, then polish.

For nerve instruments, which require a spring-temper, it is necessary to heat to a bright red, and immerse in oil; when cold, place it in the flame of a lamp till the oil on the instrument ignites and burns out, when it will be found spring-tempered.

Chisels for cutting enamel should be heated to a dull red, and well hammered; having done this, file to the required form, making the bevel or cutting edge short; about 30 deg. will be found the best angle; an edge of this description may be left very hard, without danger of breaking out. Heat as directed for pluggers and excavators, harden in water, and temper the shank to a blue, leaving the blade straw color, fading it almost white at the cutting edge. Enamel chisels, with the form of edge above described, may be made quite thin, and will be found preferable for most operations, and retain the necessary strength to withstand all ordinary pressure.

It must be borne in mind that iron or steel will color with heat, whether hard or *soft*; so that it is best to be sure of hardness before beginning to temper, which is easily ascertained by passing a file over the part that has been heated.

The best form of lamp for hardening or annealing points, &c., is so constructed that the gas from an ordinary burner will pass through a fine wire gauze. The gas must be lighted *above the gauze*. The gas burns with a clear flame, depositing no soot, so that the colors of temper can be clearly seen. Gas burned in this way gives a much more intense heat than that from an ordinary burner alone. Metcalf's lamp gives a great heat, but it is more costly on account of the consumption of alcohol.

The tempering being done, a few hints on polishing may be found useful.

The simplest way to perform this operation, where there is no foot-lathe, is to make a few strips of wood, say half an inch wide, three-eighths of an inch thick, and ten or twelve inches long; these measurements, however, may be varied to suit the taste or convenience. On one side of the strip, glue a piece of hard leather, (sole leather is the best,) the width of the wood; when dry, dress the surface of the leather smooth and flat; this may be done with a knife or sharp file. Having done this, brush the face of the leather over with glue, taking care to have the glue *hot*, and not too thick, then press the glued surface into coarse emory, (No. 90 English size is the best,) so that it becomes well imbedded in the glue, and, when dry, it is ready for use. With this the file marks may easily be polished out. A strip, similar to the foregoing, but coated with flour emory instead of coarse, and used with a little oil, will obliterate the

marks made by the first, and the instrument is ready to burnish, which is done by rubbing it hard with a hardened steel burnisher, with soap and water.

For burnishers, a strip same as above, with the leather covered with crocus—no glue is needed; it may be put on at first with a little water, in the form of a paste, after which use dry. Before using the crocus, the instrument must be perfectly free from grease, and quite clean.

When the emory wears off, it may be renewed as in the case of the new ones.

Where there is a lathe, small wheels may be fitted to it and turned true, the leather glued on, and, when dry, that turned off also, and coated with emory or crocus, the same as the strips. In this case the operation is less laborious than by hand.

For articles of ivory, bone or tortoise shell, rottenstone is the best polishing material.

For gold or silver, first use rottenstone, then finish with rouge.

As polishing materials for steel, rottenstone and rouge are of no value.

Should these few hints prove serviceable to any of the profession, especially to those who are remote from the manufacturers, on which account they are often compelled to do their own repairing, any further information they may desire on the subject, will be cheerfully given on addressing the editors of the DENTAL TIMES.

PHILADELPHIA, October, 1868.

A CASE IN PRACTICE.

BY J. S. SMITH, D. D. S., LANCASTER, PA.

Young H——, aged between eleven and twelve years, (of the bilious temperament,) was sent by his parents to a neighboring physician to have two deciduous molars removed. The doctor, however, did not operate for him, but sent the boy to me. When I saw the patient he complained of his mouth being very sore—that he could only with great effort bear any foreign substance in his mouth, and that mastication was nearly an impossibility. Deglutition was also much impaired—complaining of pain in the throat. When the patient had concluded with the statement of his complaints, I diagnosed the case carefully. In the first place I directed my attention to the deciduous molars, and very readily found that the two molars of the superior maxillary, left side, were quite loose, caused by absorption, and that they were almost covered by an excrescence of gum tissue. I at once directed my attention to the molars of the right side; those were found to be firm in their socket, free from caries, and the parts about them free from disease. The out-growth, however, had partially involved the canine, lateral, and the two frontal incisors—having almost

reached to the cutting edge—springing from the labial and lingual margins of the gums, and from between, as though it was emerging from the periosteum—of this I was not certain on first examining their condition. Those teeth involved had not spread much laterally, therefore I was satisfied that the growth had not its origin from the periosteum of the bony parietes.

TREATMENT.—First—The complete excising of the tumor. Second—Removal of the molars—this being a very insignificant matter, they being quite loose from absorption. Nitrate of silver was also applied. After this treatment, the gums were dressed with finely pulverized tannin—applied twice a day for three days. The mucous membrane of the oral cavity, reaching as far back as the fauces, was in a deep state of inflammation, with white patches of ulcerated spots. These white patches were confined to the parts contiguous to the lower frontal incisors. Very fine powdered borax was applied to those spots, and the following wash was prescribed, to be used three times daily, until the inflammation had subsided :

R.—Borax, ʒj ;
Tinct. myrrh, aqua, āā f. ʒj
Honey of roses, f. ʒj.—*Mix.*

The liver being very inactive, tongue bilious, appetite very poor, the patient was directed to undergo a little general treatment. After the lapse of five or six days, the patient resumed his usual health.

The above case I could not class with those of “epulis;” it had more the resemblance of the vascular tumor of the gums, especially to the naked eye. Not having a microscope at hand, I cannot be positive, in this report, of the pathology of the case.

Tomes says : “The gums are sometimes the seat of tumors which, but for their close structural resemblance to nævus, might come under the head of epulis.” Paget says, in his Pathology Lectures : “That fibrous tumors on the exterior of the jaws, and about other bones, resemble out-growths ; they are as if some limited portion of the periosteum were grown into a tumor overlying or surrounding the bone. The character of out-growths is, indeed, generally recognized in the epulis, or tumor of the gums and alveoli ; but I believe Mr. Hawkins is quite right in the view which he has expressed, that the fibrous epulis should be regarded as a tumor growing like other fibrous tumors from the bone and periosteum and continuous with them ; that it is prominent and lobed, is because it grows into the open cavity of the mouth, and it resembles gum only because it comes with it, or involves the natural substance of the gum.” He says : “Fibrous epulis, because growths may be found resembling

common epulis in many characters, yet differing in some, and especially in microscopic structure."

Hoping that this paper upon the above case may be of some value to the student of our profession, if only to rouse his ambition the more to study, reflect, record the passing events that occur in daily professional life, and not let slip, even what may appear at the time of notice a small thing—remembering at all times the day of small things should not be despised.

REPLY TO PROF. SAMUEL R. PERCY.

BY SAM. LAWRENCE.

I see an article in the DENTAL TIMES, for July, by Professor Samuel R. Percy, in which he recommends aluminium as being superior to gold as a base for artificial dentures, for the reason that it is lighter and cheaper.

Now, the mere difference in the weight of the two metals for a dental plate is of small moment, when we consider that an aluminium plate as thin as a gold one may be made, would not be worth anything as compared with gold, for strength and durability. A gold plate may be made very thin and light, if it is well and properly put together, and certainly would be much stronger than aluminium of the same thickness.

Gold is a virgin metal, and of indestructible quality, whereas aluminium is a metal manufactured mostly of clay and common salt, and liable to changes. The well-known strength and ductility of gold, its capability to resist the action of the saliva and other decomposing matters that come in contact with it, is an argument in its favor over every other metal. And, as for cheapness, that material is cheapest which is least liable to destruction by ordinary use, and that we know will resist the corrosive action of the acids and alkalies of the mouth. That it is a good conductor of heat and cold, so as to prevent the heating of the tissues, producing irritation, and, in many cases, inflammation. The increased action of the salivary glands may produce an irritating effect on the stomach, and, by reacting, cause salivation.

It is my opinion that it is in this way that a vulcanite or rubber plate in some cases operates in the mouth, and not by the solubility and absorption into the system of the sulphide of mercury, contained in the hardened rubber as coloring matter. It is a non-conductor, yet the mercury may be soluble in the saliva to a certain extent, but not enough to produce salivation alone. There is no bleaching of the plate by this chemical action, showing that the coloring matter is retained; and what is more, this salivation, as it is called, never takes place only where a plate is closely and well-fitted to the mouth and constantly worn, and, as I have

already said, produces this heat and stifled action, and consequent irritability, to such an extent as to produce salivation, if such it may be called. That it is true salivation, I very much doubt; for, if a metallic plate be substituted, being a good conductor, the patient will very soon recover without further treatment. I am no apologist for rubber, as I believe its indiscriminate use has been a curse to dentistry. I therefore agree with Prof. Percy, that aluminium is far superior to rubber; but I cannot yet acknowledge it superior to gold.

The time is coming when the profession will learn wisdom from the past, and be led to use only those materials which their judgment and good sense dictate as the best for the interest of their patients.

LOWELL, MASS.

PLASTER IN CAPPING PULPS.

BY GEORGE A. TAYLOR, D. D. S.

I see in the July number of the *TIMES* an article on the capping of nerves. I am surprised that an operation so easily performed should create so much dispute among the members of the profession.

I have, in my practice, tried all the foolish things recommended by the so-called stars of the profession, and, after a fair trial, have abandoned them all for one of my own, so simple and easily performed that it will no doubt cause the wise *nerve-cappers* to laugh in derision at the mere idea of such a thing.

I have been filling teeth on exposed nerves for more than a year, and have never found any difficulty where the exposed pulp was easy of access. My method is to first clean out the cavity, then apply creasote or chloroform until the pain ceases, (if there should be any at the time,) after which I take some thin plaster of Paris and pour the cavity entirely full, holding a cloth over it until it sets. I then discharge the patient until the next day in order that the plaster may become perfectly hard and firm. I then cut out about two-thirds the amount put in, and let the balance remain as my cap; I then fill with impunity. I find that the plaster alone will stop the pain of an exposed nerve when poured into the cavity thin. I also contend that it makes the most perfect capping, fitting the cavity so perfectly that you can fill without the dread of hurting your patient.

NEWBERN, N. C., Aug. 17, 1868.

MUSTARD PAPER.—M. Rigollot, a Paris pharmacist, has contrived an elegant and efficient substitute for the mustard cataplasm. He extracts the fixed oil, retaining the rubefacient principle, and saturates the paper with this. A portion of the required size is placed in water a few seconds, and then applied wet to the part. Here it is retained by a handkerchief. It is cheap, efficacious, and always ready.—*Amer. Jour. Med. Sciences.*

Editorial.

STATE SOCIETY FOR PENNSYLVANIA.

We are gratified to be able to announce that an effort is being made to accomplish the formation of a State Society upon a representative basis. Strange as it may appear, we have never had in this State an organization of this character. The old Pennsylvania Association of Dental Surgeons had something of a State character about it, inasmuch as it had members from all portions; but its organization taking place prior to the formation of local associations, it never had a representative character, nor ever assumed the legislative functions of a State organization.

It is to be hoped the recent action of the Convention at Litiz Springs will receive a hearty endorsement from all local associations now formed, and be the means of stirring up individuals in other sections to organize similar bodies. Every county in the State should be organized and represented in the State Society.

As this committee have not yet digested their plans, it would be premature to say further in regard to it. We only allude to it now, that those interested may be prepared for the call of the meeting, which will doubtless be shortly issued.

Any information desired may be procured from the chairman of the committee, Dr. J. McCalla, Lancaster, Pa.

THE CONVENTION AT LITIZ SPRINGS.

It was with great gratification that we were able to be present at the union meeting of the Harris Dental Association, of Lancaster, and the Lebanon Valley Dental Association, held at Litiz Springs, in July. The meeting was one of interest and pleasure to all participants, and the time, limited to one day, was found too short to properly treat the subjects presented. Two sessions were held—morning and afternoon.

Papers of much interest were read by Dr. Welcham, of Lancaster, Dr. Brenizer, of Reading, and Dr. Guilford, of Lebanon. Dr. McCalla, of Lancaster, presented an incompleated diagram, representing the liability of the different teeth to decay. It was the result of a daily record, kept during twenty-five years practice. Its conception had an original character about it, that promised to render it valuable as a chart of reference.

The time was mainly occupied in an interchange of views on many subjects of practical interest, eliciting many valuable suggestions. An hour in the afternoon was spent by Dr. Truman in a review of the materials for

filling, the remarks being illustrated by specimens, diagrams, microscopes, &c.

The question of forming a State Society was fully discussed, and a committee appointed to confer with other local societies, to endeavor to organize one as soon as possible.

The feeling was strongly in favor of early legislation in this State, to regulate the practice of dentistry, and to prevent, as much as possible, any further additions of incompetent persons to the profession.

The spirit of this Convention was of the right stamp, evidencing energy and interest to keep up the character and life of the Convention, and this is more that can be said of many of our associations. It was refreshing to mingle with earnest men, imbued with a faith in the dignity of the profession and determination to advance the standard of acquirement as rapidly as possible. If this Litiz Convention succeeds in stirring up the prevailing apathetic spirit, it will have accomplished very much and added to its own character. We believe such will be the result.

PRACTICAL PAPERS.

In accordance with our determination to present our readers from time to time with papers treating upon collateral practical subjects, we have endeavored to secure contributions of those only who can be considered as authority upon the subjects treated. We therefore call attention with pleasure to the article from the pen of Mr. Blake, senior partner of the firm of Blake & Whittington, whose excavators and pluggers enjoy such enviable reputation in this and other places. The conclusion of the article on the Manufacture of Gold Foil, by the manufacturer of the celebrated gold foil, W. H. Eakens, is also presented, and, we think, will be read with interest.

THE DEFAMATORY ARTICLE.

Under this heading an article appears in the August number of the *American Journal of Dental Science*, in reply to one we published in the July number of the DENTAL TIMES. Now, as there is no point raised in this article that is of any importance to the profession, we shall make no reply to it. We would have made no reply to the first article had it been a mere personal attack. But the writer assailed our College, by endeavoring to show that we were granting degrees to persons who had not complied with our regulations. We published the certificate of eligibility which we received before we examined the candidate, and as the graduate had been spoken of in not very complimentary terms in a former article, we thought it just for us to publish his letter, and the editor of the *American Journal of Dental Science* says, "which we have no doubt was

doctored for the occasion." We really think it was, but we can assure him that it came to us verbatim as it was published. Whether the young man is capable of writing such letters, the editor can, perhaps, find out for himself by attacking him again. We can assure the gentleman that we do not intend to make "*scurrilous attacks*," or use "*slang*" arguments, but when our institution or its graduates are assailed, we will use such arguments as we can command to defend them.

T. L. B.

DENTAL LEGISLATION.

Laws regulating dentistry have recently been passed in two of the States, New York and Ohio, and also in Canada. The dentists of Delaware have framed a bill, to be presented to their next Legislature for action. Other States are taking the preliminary steps to accomplish the same thing. We should be glad to present our readers with these laws entire, but they are too voluminous for our journal.

It seems to us that those already in operation are very defective in one particular, in that they do not define definitely the standing of those who are to constitute the Board of Examiners. The door is certainly being opened wide to the wholesale granting of diplomas, and, what is more remarkable, some who were most bitterly opposed to the course of the Pennsylvania College have no hesitation in serving as members of Examining Boards or endorsing their action. We fear great injury will result from this loose way of doing so important a work. Let it be done thoroughly, or not at all. If an individual is not qualified to occupy a respectable position among his fellows reject him; the avenues to knowledge are open to all, and there can be no excuse for ignorance.

In our judgment all examinations should be left with the Faculties of Colleges; their facilities for conducting examinations are far superior to any outside board. If none exist in a State, it will then answer to have the duty performed by those most competent to attend to it; but the course now being pursued, it seems to us, can only result in depreciating the value of all diplomas without any compensating benefit to the profession.

Book Notices.

Deutsche Vierteljahrsschrift for July, 1868. We acknowledge the receipt of the above number, which contains the usual variety of interesting articles, as follows: 1. Anatomical Observations upon the Teeth and Teeth Roots, by the late Professor Heider. He considers at

length the peculiarities of the shape of the teeth, as a guide in deciding to which side of the mouth a tooth belongs, in doubtful cases. 2. Contributions to the Knowledge of the Arrangement of the Dentine Cells, by E. Mühlreiter. 3. Defect of the Hard Palate and Total Destruction of the Muscles of the Soft Palate. Application of an Obturator after Dr. Suersen's Method, by Dr. Hohl. 4. Neuralgia of the Teeth, continued, by Dr. Dobbelin. 5. "Easily Flowing Alloys, by G. Blume, Dentist in Munich. He alludes to Wood's metal, and gives the proportions of that alloy. He thinks it requires too much heat to be used as a material for filling. After many experiments, he has succeeded in making a composition which excels all others hitherto known in its easily melting qualities. It is white, solid, malleable, does not oxidize. It flows like water at 132°, F. At 122°, or even at 113°, it is sufficiently soft to be manipulated in filling teeth." He further states that "Dr. Buzer asserts Wood's metal will melt at 131° to 139°, and Dr. Hauer that the same alloy has a melting point at 198°, but that he had found it quite fluid at 212°, and solidified at 177°. In his judgment this heat is too great to be borne in the mouth without injury." He also recommends his alloy in repairing rubber plates. 6. Making Galvani-Plastic Apparatus, by Ebermann. 7. Report of an Institution for the Education of Young Dentists, and a Poly-Clinic for Mouth and Tooth Diseases at Stockholm, by S. C. Bensow, the Principal. This writer says: "That they have applied arsenic paste twenty-five (25) times in odontalgia nervosa, and morphia and creasote two hundred and nineteen (219) times, which only required a repetition in twenty-one (21) cases." He further says: "That this remedy, as well as arsenic paste, has in some instances to be applied two, three, four or more times. This no one can dispute. I am not opposed to the use of arsenic from any dangerous qualities it may possess, but for *its influence on the dentine*, for by the use of the arsenical paste at least eighty per cent of the treated teeth are destroyed, even with a subsequent rational treatment." 8. The Doctrine of the Life of the Cell, According to the Lectures of Dr. Albrecht, by Fr. zur Nedden, Student of Dentistry in Berlin. 9. Papillary Tumors of the Gums, by James A. Salter. (Guy's Hospital Reports.) This is followed by selections from the American Journals, Notes of the British Association of Dental Science, and lastly, a Programme of the Yearly Dental Convention to be held at Dresden.

Dental Materia Medica. Compiled by JAMES W. WHITE. Published by SAMUEL S. WHITE, Philadelphia.

We have received from the publisher the above work, which, in the language of the compiler, is intended to give "a list of remedies in frequent use in the profession, and the indications for their employment in

dentistry." We think he has rendered an essential service in furnishing to students and others a hand-book, compact and free from all unnecessary details. Such books, while they should never take the place of larger and more thorough works, still have a value that entitles them to a place in the library of every one. To the dentist this one has an additional value in the many practical suggestions interspersed throughout its pages.

Roscoe's Elementary Chemistry. We received from the publishers, Wm. Wood & Co., 61 Walker street, New York, a copy of the above work, which we intended to notice in our last number, but from some cause it was overlooked. After looking carefully over the work, we can endorse all the author claims for it. The principal objection we can make is, he has endeavored to condense too much into it. But as most students have not time to study thoroughly the larger works, this will take their place as an elementary work, and to those who enter more fully into the science, it will be an important book for reference. T. L. B.

Selections.

TRANSUDATION OF BLOOD CORPUSCLES.

"The subjects of hemorrhage from the capillaries and of the mechanism of suppuration have recently received considerable light from the microscopical observations of a German observer, Dr. Cohnheim. By bringing frogs under the influence of woorara poison, and then tying the femoral vein, he has been enabled to watch the phenomena of capillary congestion and the resulting ecchymosis taking place in the transparent tissue of the frog's web. The remarkable point in his observations is, that he has seen the red blood corpuscles making their way through the walls of the capillaries, apparently without rupture, into the surrounding tissues. In like manner, in the case of inflammatory action, he has seen the pale corpuscle becoming adherent to the wall of the vein, making its way through the wall, and appearing on the outside as the pus corpuscles. Not the least interesting portion of a very capital meeting of the Pathological Society, on Tuesday, was that occupied by Dr. Charlton Bastian, who gave an account of Cohnheim's observations, and exhibited two frogs in the webs of which the phenomena of the passage of the red corpuscles were apparent. Dr. Bastian describes the process as one of adherence of the corpuscle to the capillary wall, then the protrusion of a small tag or process of the corpuscle through the wall, which is followed by a larger and larger portion of the corpuscle, until the whole has escaped. From his observations he is inclined to believe that the process is due to the properties or endowments of the corpuscle, rather than to any merely mechanical force."

"Before proceeding to discuss this subject, however, we desire to point

out that a claim of priority in these investigations really belongs to our distinguished countryman, Dr. Augustus Waller, who, as early as the year 1846, observed the same facts, and drew almost exactly the same conclusions therefrom, as Dr. Cohnheim has recently done. Dr. Waller published in the twenty-ninth volume of the *Philosophical Magazine* (1846) an account of several observations he had been making upon the tongue of the frog, and among other facts he records having watched the escape of both the red and white corpuscles from the capillaries under very much the same circumstances as those which have been recently employed.

"Thus, he states, (pp. 285, 286,) 'Recent observations have enabled me to decide the much agitated question as to the formation of pus, and its origin from the extravasation of the colorless or spherical corpuscles from the capillaries.'

"He then proceeds to detail the results of two experiments, in one of which he observed the white corpuscles escaping from the vessels in the mesentery of a toad, while the only traces of their points of exit 'were curved indentations in the vessels of the same size as the corpuscles, and a solution in the continuity of the parietes of the vessel at these points.' In the second experiment the tongue of a frog was employed, and in this case both the red and white corpuscles—the latter, however, in by far the greatest number—escaped through the walls of the capillaries, 'while no appearance of rupture could be seen in any of the vessels. The corpuscles were generally distant about 0.03 mm. from their parietes. After the experiment had lasted about two hours, thousands of these corpuscles were seen scattered over the membrane, with scarcely any blood disks. The process by which they passed out of the vessel could be best observed in a capillary containing stationary blood particles. Generally at a slight distance from it some extravasated corpuscles could be detected, and at the nearest opposite point of the tube a small concave depression was presented. Frequently near this depression numerous corpuscles were collected within the tube, as if about to follow the rest, which had escaped. These were frequently agitated by a movement of oscillation, which showed that there was no open point in the tube. In other spots some of these corpuscles were seen protruding half out of the vessel. Whenever the current reoccurred in a vessel presenting these appearances, the depression and unevenness quickly disappeared, and no trace of the corpuscular extravasation could be seen, except the presence of the corpuscles themselves. I consider therefore as established: 1. The passage of these corpuscles *de toute pièce* through the capillaries. 2. The restorative power in the blood, which immediately closed the aperture thus formed.'

"In a second communication (p. 397,) entitled 'Microscopic Observations on the Perforation of the Capillaries by the Corpuscles of the Blood, and on the Origin of Mucus and Pus Globules,' Dr. Waller shows most conclusively the identity of the white corpuscles of the blood with those of mucus and pus, and gives an account of several experiments which he had made to confirm his original observations. With regard to the mode in which corpuscles escaped from the vessels, Dr. Waller had evidently come to no satisfactory conclusions. He points out that it is not essentially connected with the life of the animal, as it is observed to take place after death, and he suggests that it may be due to a solvent action of the corpuscle upon the structures composing the wall of the vessel. The

essay is illustrated with plates, which clearly show that Dr. Waller had observed all the phenomena which have been recently brought so prominently before the public.

“In referring so fully as we have done to this subject, we would disclaim any desire on our part to depreciate the value of Dr. Cohnheim’s rediscovery of a lost fact, which appears likely to have most important bearings upon the progress of pathology; but we think it due to our distinguished fellow-countryman to establish his claim to the honor of the original discovery. The questions which Dr. Cohnheim has attempted to solve are, in the first place, the formation of pus from the white blood corpuscles, and, in the second, the mode in which the red corpuscles escape without any apparent lesion of the capillary system. The method of experimentation is exceedingly ingenious; and as the details are likely to prove of interest to those of our readers who have not yet had an opportunity of examining the subject themselves, we have explained them at length on another page.

“To obtain the first result, the mesentery of a frog paralyzed with woorara is exposed for some hours, the surface being occasionally moistened by an artificial serum; the various phenomena of inflammation may be observed to take place, and on the occurrence of stasis, or, rather, during the preceding oscillating stage, the white blood corpuscles, which have become apparently attached to the walls, either singly or in groups, gradually give rise to a bulging of the vessels, the corpuscles thus lying in pouch-like cavities projecting from the tube. Presently the corpuscles cease to be seen within the capillaries, and may be seen lying free in the tissue around it: sometimes they may be caught in the act of escaping, but it is extremely difficult to determine the exact course which they follow through the wall of the vessel. After their escape no difference can be observed between them and the others which remain within the vessels. Our leading histologists have long been agreed that pus corpuscles are related to the white blood corpuscles both in structure and in origin. Virchow traces the formation of pus from the nuclei of connective tissue, and on free mucous surfaces from the epithelial cells; he fully recognizes, however, the connection between the pus and blood corpuscles, and makes use of the following remarkable expression: ‘Both have a like type of formation. It may, therefore, be said that pus has a *hæmatoid* form; nay, the old doctrine may be revived afresh, namely that pus is the blood of pathology.’—*Cellular Pathology*, p. 482.

“This new view, then, of the development of pus presents no feature at variance with received doctrines, and the great question yet to be determined is, whether this is the only or even the most common mode in which the process takes place, and for the answer to this we must look to the future.

“The second experiment consists in producing congestion of the capillary system in the web of a frog’s foot by the application of a ligature to the femoral vein. The resulting phenomena are: 1. Retardation of the stream. 2. The occurrence of oscillation. 3. Stasis. This is followed by massing together of the corpuscles, and the adhesion of a few red corpuscles to the walls of the vessels, which usually become pouched at these points. On relieving the congestion by removing the ligature, the conglomerates of corpuscles break down, and the stream speedily recommences. The corpuscles, however, which had become adherent to the walls are now seen

to pass through them, and to appear in the surrounding tissues. They are followed by others, and soon the spaces between the capillary network will become loaded with blood globules. They may be watched in every stage of their transit. In attempting to determine how this process takes place, we have to consider, first, whether there are really apertures in the vascular parietes; and, second, whether the result is due to any peculiar properties of the blood corpuscles themselves. Dr. Cohnheim inclines to the belief that interspaces exist between the cells of the lining membrane of the smallest vessels, and in this view he is supported by the fact that openings have been proved to exist in the smaller branches of the lymphatic system, apparently in connection with the stomata-like orifices in the epithelium of the serous membranes, through which branches of considerable size may be injected. The existence of such orifices is, however, still a matter of dispute; and whether this be so or not, it is most probable that the blood corpuscles themselves take an active part in the process.

“The amoeba-like movements of the white blood corpuscles have recently attracted the attention of several able observers. Professor Max Schultze states that he has even seen them protrude arm-like processes, and embrace minute granules of organic matter, such as abound in the molecular base of chyle or milk. Endeavors have been made by more than one observer to determine whether these movements are influenced in any way by disease, but, up to the present time, with indifferent success. More recently attention has been directed to similar movements on the part of the red corpuscles under certain conditions, especially that of exposure to a moderate heat. Some have viewed these latter movements as purely physical phenomena, and in no way connected with the individual life of the corpuscle; but analogy would induce us to consider this view as incorrect. The theory of the individuality of cell-life has, moreover, been steadily gaining ground of late years, and the whole tendency of modern physiological and pathological teaching has been in this direction. After a careful examination of such specimens as those exhibited by Dr. Bastian at the last meeting of the Pathological Society, few can fail to be convinced that the corpuscles themselves are really active agents in their migration through the vascular walls; and when this fact is fully recognized, much light may be thrown upon hitherto obscure blood diseases.—*Med. Times and Gazette.*”

NEWBERN, N. C., August 17th, 1868.

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No. 906 Walnut St., Philadelphia.

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PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Thirteenth Annual Session, 1868-'69.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation,

and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

ANATOMY AND SURGERY.

The instruction in this department will embrace a plain and comprehensive view of the structure of the human body. The lectures and the demonstrations will be given over *the dead body dissected for the express purpose* of elucidating the subject. With the same object, vivisections on the lower animals, while under the influence of an Anæsthetic Agent, will be employed. Such description of the comparative anatomy, microscopical structure and connections of the teeth, as their importance may demand, will be fully given. The valuable and extensive collections of Anatomical Preparations of the incumbent of this chair, consisting of wet and dried specimens, papier mache manikins, models in wood, and accurate French plates, will enable him to illustrate his course of lectures very clearly.

In addition to the above course, a Surgical Clinic will be held by Doctor Forbes during every week, for the purpose of performing such operations in oral and general Surgery as may be deemed advisable to advance the student in this particular branch of knowledge. The cases will be selected from a dispensary which the Faculty have established.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical peculiarities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND HYGIENE

The intention of the course on PHYSIOLOGY AND HYGIENE will be to convey a knowledge of the essential principles of general and human physiology, in such a mode as will best develop their application to the preservation of health. The subjects of physiology and hygiene will be, to some extent, interwoven, with a constant aim at clearness and simplicity of instruction.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the Demonstrators.

IN THE OPERATIVE DEPARTMENT.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

IN THE MECHANICAL DEPARTMENT.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

PRACTICAL ANATOMY.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

HOSPITAL CLINICS.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

FEEES.

Matriculation, (paid but once,) - - - - -	\$5 00
For the Course, (Demonstrator's ticket included,) - - - - -	100 00
Diploma, - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Leidy's or Gray's Anatomy; Carpenter's or Kirk's Physiology; United States Dispensatory; Pereira's, Biddle's or Stille's Therapeutics; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Physiological Chemistry; Hartshorne's Principles and Practice of Medicine; Wood's Practice; Toines' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the subject.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupillage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before

the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

CANDIDATES FOR GRADUATION WHO HAVE NOT ATTENDED LECTURES.—Dentists who have been in continued practice since 1852, are eligible to be candidates for graduation without attendance on lectures. The candidate for graduation must present satisfactory evidence of his having been in practice for the allotted time, also of his good standing in the profession. He must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must undergo a satisfactory examination by the Faculty, on each of the branches taught by them; when, if qualified, he shall be recommended to the Board of Trustees, and if approved, shall receive the degree of Doctor of Dental Surgery. Of this class of graduates, the matriculation and diploma fees only are required.

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DENTAL CARIES.

BY JAMES TRUMAN, D. D. S.

In the April number of this journal was given a translation of Dr. Leber's views of the cause of dental caries. I remarked, at that time, that the theories entertained opened a new and interesting field of observation, and, if sustained by further examination, would go very far to clear up one of the most difficult problems that we, as a profession, have had to contend with. Our readers will bear in mind that the theory was, in substance, that the growth of fungi in the cavity of decay acted upon the walls of dentine by penetrating the tubuli in all directions, and destroying the continuity of the tissue; that this result was largely aided by the presence of acid secretions constantly held in contact with the tissue.

The fact that these low orders of plants existed not only in the mouth, but in other diseased portions of the body, has long been well understood; but I think the conclusion, that they directly or indirectly had anything to do with the production of caries, is an advance upon the theories of the past, and a positive addition to our knowledge of the pathology of these structures.

The interest and importance attached to the subject led to special investigations, to verify, if possible, the statements made. The examinations have not, as yet, been concluded, but sufficient has been accomplished to satisfy myself that the facts warrant the theory promulgated.

In the past we have been forced to rest satisfied in considering dental caries, that the agent was an external one, acting chemically by dissolving out, by gradual process, the inorganic material, and still more gradually the organic or animal matter of the tooth. This, in brief, covers all the theories that I am aware of that have pre-existed in regard to caries. The insufficiency of this explanation has long been painfully apparent. Dr. Tomes candidly acknowledges "that by no artificial means had he been able to simulate caries." Indeed, caries, in none of its conditions,

resembles any of those produced by the chemical destruction of an acid. Take, for instance, the fissures in the masticating surfaces of molars and bicuspid. In these teeth, the process of destruction will advance so slowly, in many cases, that it may take years before any marked change in the structure has taken place; and yet it is equally certain that progress is made, and that without cessation. Again, cases occur where the opening through the enamel is so exceedingly minute as to defy the most careful examination. In one such I was obliged to make an artificial opening, to reach the caries that was evidently destroying the whole interior of a bicuspid. Also, we find the same result taking place on the approximal surfaces, when the opening is too minute to admit a sufficient quantity of fresh acid to keep up the continued action.

It has, therefore, long appeared to me that we must look elsewhere for the cause; that it must, in the nature and progress of the conditions found, be self-creating. This position was taken several years ago, without the then necessary microscopic knowledge to verify the theory. The examinations I have been able to make during the past three months have been confined to carious cavities, the surfaces and necks of teeth. In all the caries examined, without any exception, was found a dense mass of fungi, (*leptothrix*, and in some cases spires of the *oidium altreaus*.) To test and verify the eye examination, the specimens were repeatedly submitted to the reagent, iodine, to detect the presence of starchy matter. The reaction was the peculiar purple tint in portions of the plants, in every case. But only that it makes the evidence more conclusive, there is no necessity for this reagent; the masses accumulated are the best evidence, and all that is absolutely needed. To the observer, the disagreeable if not disgusting portion of caries becomes, under a high power, a most beautiful and interesting object of study. It may properly be compared to a well-constructed aquarium, with its plants and constant moving life. The infusoria are in constant activity. Their varied forms darting here and there, twisting and turning, keep the surface of the fluid in constant agitation. The outside and visible world is forgotten in viewing this representation of life in a condition so minute, that the mind fails to grasp the fact, or to realize the possibilities of its existence.

Whether these low forms of cryptogamic plants destroy the tissue by penetrating the tubuli, or accumulate in masses, and by their presence and action generate the acid condition necessary to destroy the tissue, is, in my judgment, not material. The important fact still remains that they are there present, giving, I think, the peculiar dark color to caries, and in either case they must produce the destruction witnessed. The size of the *leptothrix buccalis* warrants the opinion that it could penetrate the dentinal tubes; but I doubt the probability of this being possible. The

tubes are filled with a structure that is the last to be destroyed in the advance of the disease; in fact it is exceedingly difficult to destroy the tubular contents, as they will resist for days the action of strong chemical agents. This fact I hope to demonstrate in a future article on the distribution of nerve fibres in the teeth. I think we must look elsewhere for the effects upon the dentine. Wherever we find these growths in the mouth, we find there an acid condition. The secretions at the necks of the teeth are proverbially more acid than any other portion, and there I have found the growth at times excessive; also upon the green stain of children's teeth, so destructive in its chemical action upon the enamel.

The point that seems to me to be proven is, that these fungi grow and are developed in an acid menstruum, that they penetrate and increase with marvelous rapidity in any depression, defect in structure or artificial lesion in the tooth substance, and by their constant development destroy the tissue. If this be admitted, and I cannot see how any candid investigator can reject it, then the whole series of difficulties in regard to the commencement and progress of caries are removed, and the once difficult problem becomes simplified and easy of comprehension.

If the article of Dr. Lebers, and the exceedingly able and interesting one of Dr. Schrott, that we have had translated for this number, throw any light upon this subject, we shall feel that we have done some service in being the first to present them to the profession.

We have endeavored to give all the essential parts of Dr. Schrott's article, and only regret that we have not been able to give, in full, the very interesting and instructive illustrations in the German quarterly from which we translate. I have verified nearly all his statements by actual observation, and have no hesitation in endorsing most of them as exceedingly clear in detail and exact in investigation.

It must be remembered, however, that not only are the *volvocineæ* classed in the vegetable kingdom, but the *vibrionia* also, by many writers; and this is partially admitted by Dr. S. in a foot note. Dr. Cohn, as the result of his examination of *vibrionia*, says:

"1. That they apparently all belong to the vegetable kingdom, for they exhibit an intimate affinity with undoubted *algæ*.

"2. By reason of their want of color, and their occurrence in decomposing infusions, the *vibrionia* belong to the group of aquatic fungi, (*mycophyceæ*.)"

They, however, lose none of their interest to the observer on this account, and whether we consider the motion voluntary, and, as Ehrenberg supposed, a proof sufficient of animal life, or whether they move involuntarily by a vibratile fibre, they are equally deserving our attention and close observation.

Whether they have any effect in hastening the destruction of the tissues remains yet to be proved; but it is hardly to be supposed that they can have any direct influence.

THE INHABITANTS OF THE MOUTH AND TEETH.

BY DR. SCHROTT, MUHLHAUSEN, GERMANY.

(Translated by Mrs. H. Hirschfeld.)

I wish to lead my colleagues to a field commonly very little known in our profession, and to show them the microscopic wonders of nature. I wish especially to appeal to their conscience, with convincing proofs, that upon every particle of decay left after cleansing a cavity, thousands of plants and animals are inclosed by the filling, developing themselves at the expense and final destruction of both.*

To make these observations, he advises a microscope capable of magnifying from seven to eight hundred times, and mentions the difficulties liable to a beginner, who is very apt to be deceived by different movements. The attraction of the homogeneous and the repulsion of the heterogeneous molecules, produce in the fluids to be investigated a constant movement, which gives to most of these small bodies an animated appearance; but this is only the result of the first-mentioned forces.

The formations found in the mouth belong to the three natural kingdoms. We first take the *saliva*, which, in its normal condition, contains no hard substances, and is perfectly transparent and fluid. As soon as it flows over the mucous membrane of the mouth, and becomes mixed with its secretion, we find different foreign bodies in it, to which I shall allude hereafter. Saliva brought on a glass slide and dried, exhibits crystallization.

SECRETION OF THE MUCOUS MEMBRANE.—The secretion contained in the glands of the mucous membrane is transparent and yellowish, without other bodies than epithelial cells. The mucous corpuscles, as found in the mouth, are formed after mixing with the saliva. Dried mucus forms regular beautiful crystals. Similar crystals are found in nearly all animal fluids if dried in the same manner. They should more properly be called formations of the drying process than of crystallization.

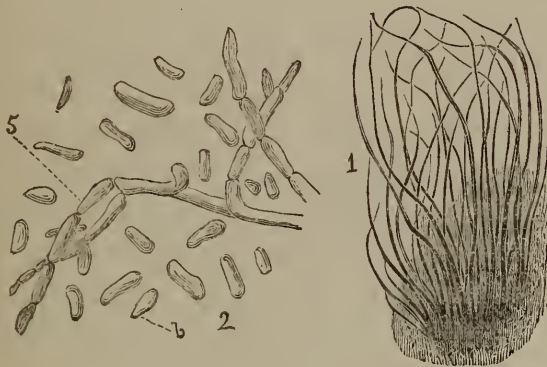
To the vegetable formations belong, in the first place, the parasitic cell or tooth fungus, *protococcus dentalis*. As soon as a destructive or dissolving cause has injured the enamel or dentine, the vegetable cell is

* This position of Dr. S. is wholly unsupported by facts. The continued existence of fungi and infusoria in the carious cavity is dependent on constant additions of moisture. If, then, a thoroughly perfect filling be placed in a cavity, all moisture is excluded, and death ensues to all living particles inclosed. That this result follows, is constantly proved in practice; portions of caries being left over nearly exposed pulps, with an entire cessation of the destructive process.—Ed.

formed. As the moss on the roofs and the green precipitate on the teeth are vegetable formations, which force their spores into the more or less porous ground on which they live, and at whose expense they multiply and enlarge, exhausting and destroying its surface, so acts the fungus on the tooth substance. The principal cause of the destruction of the teeth is, hence, no other than the parasitic, vegetative growth which takes place everywhere where acid fermentation or decay occurs.

ALGÆ.—Though the algæ of the tongue (*leptothrix buccalis*,) (fig. 1,) are of the most frequent occurrence of the vegetable parasites, yet their origin and propagation is nearly entirely unknown. Their growth is very extraordinary, one single night being sufficient to cover the tongue and the gum with a turf of these parasites. If the mouth be not cleansed in twenty-four hours, whole bunches may, by careful handling, be taken from the posterior part of the tongue and the spaces between the teeth.

The excessive quantity of these plants in every mouth—in healthy, as well as unhealthy individuals, in animals as well as man, lead to the conclusion that these formations do not belong to a pathological but to a normal condition.



OIDIUM ALBICANS, also called champignon du muquet, is chiefly found in children as long as they are nursing, and in adults, on aphthous ulcers, and in decayed teeth, with periostitis. This parasite is easily recognized, from its being much larger than the algæ. By throwing off the spores, which are formed on the extremities of its branches, it is constantly surrounded by oblong cells, which, in settling on the mucous membrane, develop themselves like seeds to new plants. Not unfrequently are these parasites transplanted by the child to the mother, where they grow in the folds of the nipple. Fig. 2 is a plant in its full development; fig. 2 b, the spores. Varieties of this plant are found according to the difference of the ground on which they grow, or to the age, sex, diseases, etc.

THE INFUSORIA.—The majority of living beings found in the mouth, and in every organic infusion, are the vibriones, (fig. 3, 4.) The excessive number found in decay, and in the spaces between the teeth, led several

naturalists and microscopists to consider them as a peculiar variety, and to call them denticolæ; but neither their lodgment nor their mode of living justifies this name, because, as above remarked, the same infusoria may be developed, and in the same manner propagated outside the mouth. An entirely different species of infusoria inhabit the decayed tooth substance. As soon as the tooth structure is decomposed by the chemical vegetative process, *i. e.*, changed into moist caries, every tubule of the dentine is inhabited by innumerable living beings, which, by their extreme minuteness, the rapidity of their movements, as well as their shape, are decidedly different from the common vibriones, and may be termed more correctly denticolæ, (figs. 6, 7, 8, 9.) I have not yet been successful in preserving these denticolæ in distilled water, or have them grow there, as can be done with vibriones, monads and algæ. If a piece of caries lies twenty-four hours in water, vibriones are developed, and assume, in a few days, vermicular movements. After ten or fourteen days, they become spirillæ, reaching, in four or six weeks to five or six windings. The denticolæ proper disappear, or become themselves vibriones.



The size of the vibrios is of an average $\frac{1}{1000}$ of a millimetre, and may be very well seen 500 times magnified. The denticolæ becomes but $\frac{1}{10}$ that size, and can only be seen with the most perfect instrument. In consequence of the rapidity of their movements, it is hardly possible to recognize their forms or represent them by drawings. As the diameter of the dentinal tubes are from $\frac{2}{1000}$ to $\frac{5}{1000}$ of a millimetre, and 20 to 100 times larger than the denticolæ, it is readily explained that in a small piece of caries can exist innumerable living beings, who have free access to the pulp.

We regret that the optician has not yet furnished us with an instrument which would enable us to distinguish the organization of these minute creatures, as neither the intestines nor the organs of movement can be shown by the most thorough examination; therefore it is that scientific men and the microscopists differ so much in their opinion. Some attribute

to them a very delicate and complicated organization; others deny it entirely. I cannot agree fully with one or the other party. The organs of these beings may be ever so imperfect; but we see their movements, and very rapid movements, indeed. Now, when these are manifested, there must be organs of movement. These may be peristaltic or ciliary; at all events they can only be executed by muscular force. As we see the effects of these organs so distinctly, I think their existence cannot very well be doubted. It may be in the same way with the digestive system and other organs, in comparatively higher orders.

In regard to the influences which the infusoria exert on the condition of the teeth, the opinions are just as much divided; but, I am satisfied that they are not in the least injurious to them. The best proofs for this opinion are: *First*, that they are found at every age—in healthy as well as sickly individuals, in good as well as diseased teeth. *Second*, in animals, which nearly never have decayed teeth. *Third*, that they move and propagate in the fluids of the mouth, and never attack the tooth substance. *Fourth*, that nearly none are found in decayed teeth, in which the vegetative growth is in superabundance.*

SPIRILLÆ.—This is a variety of the vibriones, and are found in hollow teeth, in which the fluids of the mouth are not daily renewed. Frequently they are found in the spaces between the teeth, and beneath artificial dentures, where they have one or two windings, (fig. 5.) No microscopic object excites the observation of the observer, more than these little screw-like lines, which move to and fro similar to living cork-screws, and with extreme rapidity, the eye and mind being incapable of comprehending how this rotation is accomplished.

To procure the best exhibition of this kind, it is only necessary to take a piece of fresh, soft caries, place it in a vessel which contains one or two ounces of distilled water; cover it so that the air has little access. After having left this infusion two or three weeks, take out this piece of caries, with the adhering drops of water, and, placing it under the microscope, an indefinite number of spirillæ, with from one to six windings, may be seen.

AMEBÆ AND MONADS.—In consequence of the resemblance of these infusoria to each other, it is very difficult to distinguish to which class

* It has been lately proved by thorough investigation, that many of the infusoria should be classified in the vegetable kingdom; for instance, the volvox, which is said to be an agglomeration of vegetable cells. Its animate contents are considered to be spores, provided with cilia, which moves, form chains, or are developed into other plants.

According to Hallier, many denticolæ should be also recognized as spores, from lepthotrix or protococcus dentalis.

they ought to be placed. Both are transparent, round or oval shaped, granulated, without perceptible organization, essentially changing their forms according to the contraction or expansion of their body. They are found most frequently beneath artificial dentures which have not been cleaned for some time; less frequently in decayed teeth and those not used in mastication. They are rarely found in the deposit on the gum and mucous membrane of the mouth, (fig. 10.)

VOLVOX.—A very peculiar appearance represents a class of volvox found in nearly every mouth, but most frequently where the gum is not touched by the food, and where a white deposit is formed. They may be found also in the interspaces between the teeth which are not used in chewing. The leucocyt, or the so-called mucous globules, (*globules muqueses*,) have very likely been confounded with these infusoria. These globular bodies may, perhaps, be formed in the secretion of the mucous membrane after having been deposited for some time on the gum or the adjoining tissue, and having undergone a certain alteration. If we examine these mucous globules more closely, we will see that their contents are perfectly alive. I saw such globules out of my own mouth burst under the microscope—their contents a mass of living bodies, streaming out and distributing themselves with great rapidity in every direction in the surrounding fluid—fig. 11. The remainder of the globule was dissolved and disappeared. Whether these globules are an agglomeration of infusoria, like the volvox of Löwenheuk, Spalanzani, Müller, Ehrenberg and Dujardin, or whether they are developed in the mucous globules and by the dilaceration of the enclosing membranes, and the transition into another substance, are metamorphosed, I am not yet able to determine. We find, however, these globules in different degrees of development. The larger and darker they are, the more lively are their contents, and the nearer they are to maturity and to bursting. This leads to the conclusion that they are developed in a common integument, and by the throwing off this envelopment, they are born to a new existence. But whether these young animalcules become again infusoria, like those from which they have sprung, or whether they are metamorphosed individually, live and propagate independently is, as I believe, not yet stated beyond doubt.

Dr. Schrott says farther, in regard to the whitish deposit, which is found every day on the tongue and gums, that it consists of a mixture of saliva and mucus in a state of decomposition, blended with molecular granulation, epithelial cells, algæ and living infusories.

TARTAR.—In considering the tartar he says: “By chemical analysis the constituents of the tartar are dissolved; but few chemists agree in their

qualitative, and still less in their quantitative analysis. If I were to communicate all the theories known to me in regard to tartar, I could not avoid ridiculing some opinions, and thereby making my article too extensive. Even microscopic authorities could not give me any satisfactory result, until I was able to decompose this substance myself, and examine it under the microscope.

“It was not an easy task for me to decompose the tartar to its single constituents and to recognize them, as the chemical as well as the mechanical separation of the particles, changes them so much as to render them indiscernible. I had first, by different means, to kill the infusoria, allow them to dry, and to compare their changed form with those in the tartar, in order to recognize them.

“Tartar is not always of the same quality, as its quantitative proportions differ often very much, yet we may accept as an average the composition to be as follows: 60 per cent. infusorial residues; 10 per cent. vegetable products, (algæ); 15 per cent. molecular bodies, which probably will include the living precipitate of the fluids of the mouth; 10 per cent. remnants of food and epithelial cells: 5 per cent. soluble salts.

“Tartar is not formed by precipitation. By this word I understand the separation and deposition of dissolved solid bodies in any fluid. Tartar is formed by gradually settling down, commencing at such places where the least change of material occurs, as beneath the posterior margins of the enamel of the incisors, and on the approximal surfaces of the molars, especially where a diseased tooth prevents the mastication on that side. These localities are the real gathering places for the infusories. Here they dwell longest and reach their highest age, die and their limy residues unite with epithelial cells, algæ, remnants of food, saliva and mucus, forming in this way the tartar. The soft tartar from young persons is best suitable for examination, because it is rapidly formed and remains soft. If we examine the surface of a fresh piece, by scraping it off with a knife and softening it with distilled water, then placing it under the microscope, we will be able to see all the living infusoria, together with a great many dead ones, also algæ, epithelial cells, molecular granules and food. In scraping the piece of tartar the second time, after the first layer has been removed, we see by examination, very distinctly, the dead vibriones.

“The algæ, by the necessary trituration, become shorter, and the epithelial cells more indistinct. The deeper we go down to the older layer, the more the tartar becomes hard, and the more mechanical pressure is required to effect the separation, the more indistinct become its single constituents. But even here, where the tartar is already entirely petrified, can the different objects be shown by a close examination.”

Deutsche Vierteljahrsschrift.

AN INFUSORIAL NURSERY.

TRANSLATED BY H. HIRSCHFELD.

This is an ingenious idea of Dr. Schrott, of Mühlhausen, Germany. This gentleman takes a goblet with a wide opening, and places a sponge at the bottom, saturated, and lying half an inch in distilled water. He then takes common glass slides, with the substances for investigation, places the thin glass cover over it, and a piece of thread close around three sides of the cover, whilst they are left to hang down as long as the glass slides. These glasses are now vertically inserted into the goblet in such manner that the thin glass cover, with the thread, is directed toward the walls of the goblet, and the other side toward the sponge, which serves to keep the glasses in position. The goblet is now to be covered with a lid. By virtue of the capillary attraction, the water between the two glasses is always kept at the same stand-point, because the supply cannot exceed the evaporation. This method affords several advantages: First, it makes it possible to observe the growth and development of the plant in the same preparation day after day. Second, the life of the infusoria is not endangered by prolonged observation under the microscope, as the water can be constantly supplied by the thread, and no current or change under the cover glass is hereby produced. Third, the preparations can be kept until they become over-ripe, and follow the general laws of nature, or other formations make their appearance. Fourth, it saves a great deal of time, as the preparations are always ready. In this manner, I saw in a week the formation of beautiful bouquets of algæ, with an indefinite number of infusoria moving around between them.—*Deutsche Vierteljahrsschrift*.

 MICROSCOPY OF THE TEETH—ABSORPTION OF DECIDUOUS TEETH.

BY S. P. CULTER, M. D., A. E. G., D. D. S.

This is a subject already hackneyed and overdone, yet still is an unsettled one.

There have been many theories advanced, all more or less antagonistic, and I shall expect to differ from all; therefore, who is to decide. who is to be the umpire of such unsettled questions?

We are told the roots of deciduous teeth are absorbed by the pressure of the permanent. This I believe to be true, but what, may be asked, is absorption? We know the meaning of the word better than we know the process.

Wherever the permanent teeth press on the deciduous, they then undergo absorption, and the process continues so long as there is any

pressure; in some cases, into the enamel, or rather, under the border of that tissue, some distance into the crown. I have one now in my possession of this kind, which I extracted but the other day, with deep grooves into the dentine of the crown. The fangs were all gone under the border of enamel, and only attached by one side of the neck, and very loose. Some of the pulp remained in the upper portion of the crown cavity, and in the deep groove, near the enamel, a fleshy substance, similar to pulp, with signs of blood vessels.

In a similar case, recently extracted, the crown of a molar had but part of one root left; the outer portion deeply grooved, with a live and healthy pulp, to all appearances, remaining. This was a second superior molar, riding on its successor, the bicuspid.

In the aforementioned, and all similar cases, what becomes of the pulp? As a matter of necessity, that portion impinged upon must be absorbed, and that by the same law of necessity. Still there remains sufficient to sustain vitality in the dentine, in order to facilitate the process of absorption, for this would not proceed as fast, and would be very different in some respects, especially that of the dentine; the lime being no doubt the same in both, and the same as in all other bone absorption, either in a diseased or normal condition.

In the case cited, I subjected the remains of the pulp to the microscopes which exhibited vascularity, cellular tissue and some nerve filaments, there being no signs of decomposition in this or the latter named case, both being perfectly healthy to all appearances.

The rapidity of absorption is governed entirely by the rapidity of growth of the permanent tooth, and no faster. There may, perhaps, be exceptions to this, as in cases of very dense deciduous, the permanent may be retarded. There may be cases where the resistance may be so great as to arrest the development of the new tooth altogether. In some cases the deciduous retains its position permanently, and may ultimately become denser and more calcified, so that it will resist, in some instances, the ordinary course of decay, even to old age.

This latter conclusion may be accounted for in this way: when nature is obliged to make permanent use of a tooth, designed for a temporary purpose, she must so change the structure that it will be able to offer the same resistance as the permanent teeth. This she can readily enough do by further calcification and differentiation, or, in other words, the law of necessity and adaptation changes the temporary into the permanent.

This, however, is not always the case, there being exceptions to the rule. This change or advance can readily be accounted for, from the fact that the structures are identical in both, it only requiring the same hardening process that goes on during life in the permanent.

All these facts are already too well known to need further comment from myself.

In such cases named, what should be done? Should such teeth be extracted, with the expectation of the permanent taking its place, say at twenty-five or thirty years, presuming it to be a cuspid tooth? I have not seen much written on the subject. What is the experience of the profession? Would there always be indications justifying the extraction of such teeth that would insure the appearance of the permanent; if so, what are such indications where no signs exist of the approach of the second tooth, which, in the upper, as is well known, is situated high up in the maxilla, in contact with the os malar?

Another important question refers to the process of absorption. How is the lime removed from the solid tooth structure, and how disposed of after being taken from it? I entertained the idea that the lime of bones was always removed in one and the same place, under all circumstances, in the same manner as the decaying of a tooth; that it was the work of an acid—the action being a local one, even when that acid is the result of an acid diathesis. The action is a chemical one, the same as a similar process out of the system, by adding acid to bone. In the case of absorption of deciduous teeth, the acid is generated at the point of action, or carried there by the circulation, which, I am not quite certain. At all events it is provided for by the necessity of the case—the provision being anticipated from the formation of the first living animal cell.

How does this acid perform its work? It may be answered, by combining with the lime of the tooth, which is an alkaline earth or salt. Any acid having a stronger affinity for the lime than the phosphoric, be it ever so much diluted, will, by slow degrees, as in the case of decay of a tooth, gradually disintegrate the earthy salt, and, at the same time, the dentine or animal portion is oxidized, precisely as in other soft tissues.

In order for this new salt of lime to become in a suitable condition to be conveyed out of the system by the general circulation, it must be a soluble salt, such as a chloride or acetate, citrate, nitrate, tartrate, or some other, not sulphate.

After the absorbing or disintegrating portion becomes, by looseness, exposed to the action of the saliva, it may be washed away by that fluid, and no longer enter the circulation. The acids of the mouth may also assist disintegration, and so hasten the process. The dentine or animal portion is now to be disposed of. As in all other tissues, this substance must be oxidized away as rapidly as the lime removes the products, which are, mainly, carbonic acid, water and ammonia, and come under the head of disassimilation. Some of the resultant products may be of further

temporary use before leaving the system, such as water, carbonic acid, and ammonia.

This process of oxidation is both a calorific and a refrigerating one. The oxygen condenses in the act of combining, and heat is given off, and as the hydrogen and carbon combine, and change from a demi-solid to a gas and fluid, heat is absorbed to effect the change. By these compensating processes, over-heating of the tissues is retarded or prevented, and there is no danger of over or under-heating in any portion of the system.

Heat alone is sufficient to decompose carbonate of lime, such as marble and mountain limestone, the carbonic acid escaping as gas; so it may be easily decomposed out of the teeth by any vegetable or mineral acid, be it ever so much diluted, though only a small per cent. of carbonate exists in the teeth. The phosphate of lime cannot be decomposed by heat at all; hence it requires a stronger acid to decompose the phosphate than the carbonic, though any of the mineral, and many of the vegetable acids decompose it. The phosphoric being easily soluble in water, readily passes into the general circulation, if not united with any other base to form a soluble salt. In either case it could readily pass from the system through the urinary organs, if no longer needed, or it may meet with some oxide of lime, and again unite to form new bone. Nutrition, through this latter hypothesis, is hardly tenable, as we do not expect to find free oxide of lime in the system from any source. Lime enters the system generally with food, chiefly in the form of phosphate; also, in water, as almost all well, spring and river waters contain lime in some form, in variable quantities. Rain and snow water contain none. The portion of grains and fruit that contain the largest per cent. of lime, and other mineral elements, is the husk or outside covering of all grains and seeds, and the skin or peeling of all tubers and fruits, all of which are generally cast away, contrary to nature's designs.

To return to the case in point, as the inner portions of the fangs of the above tooth become absorbed, and the pulp cavity exposed, the central plexus of fibres being sufficiently tenacious to resist the pressure, gradually yielded outwardly. As sufficient of the fibres rested on the sides of the permanent crown to maintain vitality in the pulp, it is also reasonable to infer that sufficient blood vessels also remained to supply nutrition to the pulp, especially in that portion of the fang not all carried away, that having a groove in it sufficient to retain the nerves and blood vessels with the remaining portion of pulp intact. It will be recollected that the permanent intruder is a bicuspid, and not so large as the deciduous. How could the theory of dentinal tubular fluid account for the above case? The fluid would all escape.

We need further observations on the above subject.

FILING TEETH—DR. ARTHUR'S METHOD.

BY JAMES TRUMAN, D. D. S.

The discussion of this subject, at the present time, in the various Dental Associations, is but another evidence of the disposition to adopt at one period practices that have been discarded at a previous one as valueless or absolutely injurious. It is undoubtedly true, that in all the modes of practice that have at various times been introduced in our profession, and been abandoned, there has been a large admixture of truth with a still greater amount of error. That this is true of filing teeth, must be evident to any one who will take the trouble to read the history of dentistry for the past hundred years. It is within the knowledge of all, that filing was mainly practiced as a preventive of caries during the last, and the first twenty years of the present century. The skillful use of this instrument entitled the individual to rank high as an operator with the public, in France, England, and in this country. But we find writers in the latter part of the last century condemning the practice as dangerous and destructive to the teeth. Berdmore,* writing in 1770, speaks thus of this operation: "It cannot be supposed that any man is so lost to shame and humanity as to expose his patient to pain and inconvenience during life, merely for the sake of a trifling fee. The indiscriminate filing of teeth, so common at present, should be imputed only to ignorance, and may, I hope, be checked, by placing the subject in a clear light, and by *drawing the line* to distinguish where it may and where it may not be practiced with safety." He then proceeds to give his views when it is expedient to use this instrument, which generally accord with present practices.

This able author had the clearest and best practical ideas of his day, and in many respects we have failed to improve upon the modes adopted and promulgated in his work. His opinion is, therefore, to be received with weight in considering the effects of this practice. But, while it is evident that the per centage of failures at that and subsequent periods must have been largely in excess of successes, we, it seems to me, have no reason therefor to conclude that no permanent good resulted from the practice. A large allowance must be made for the modes adopted, and for the evident want of knowledge in practical details and of the minute structure of the teeth.

Gradually, separating teeth by the file fell into disuse, until many excellent operators almost altogether abandoned it. I have long been satisfied that this is a practical error—believing that, where judiciously used, it is one of our most valuable instruments. It must be evident to

* A Treatise on the Disorders and Deformities of Teeth and Gums, by Thomas Berdmore, London, 1770.

every practitioner that a wholesale destruction of teeth is going on yearly, from a want of knowledge when and how teeth should be separated by the file. The prejudices that surround this subject prevent a clear judgment, and lead to fallacious reasoning.

The propositions laid down by Dr. Arthur, as a basis of reasoning and practice, are as follows :

“ 1st. That caries will attack the proximate surfaces of all the teeth, except the inferior incisors, of the great majority of persons of the better classes in the United States at the present day.

“ When caries of the superior incisors occur on the proximate surfaces previously to the twelfth year, its occurrence, sooner or later, on the same surfaces of all the teeth, except the inferior incisors, is almost certain. In the greater number of such cases, the caries will show itself before the twenty-fifth year. This predisposition to caries is greater in the female sex.

“ 2d. That caries is not liable to occur at the points indicated, unless the teeth are in contact.

“ 3d. That an artificial, permanent separation of the teeth will arrest superficial caries, or prevent its occurrence, if the attack has not actually begun.

“ 4th. That it is a popular fallacy to suppose that caries necessarily follows the removal of enamel.

“ 5th. That the most efficient means of preserving the teeth is to anticipate the attack of caries by separating them, when it is ascertained that caries is likely to occur on the proximate surfaces.”

The position laid down by Dr. A., that when caries attacks the superior incisors previously to the twelfth year, that it will also attack the proximate surfaces of all the teeth, except the inferior incisors, cannot be successfully controverted. The teeth, in their various degrees of development, are necessarily subjected to the same influences that operate either to the benefit or injury of the structure. If, therefore, caries be found on the proximate surfaces of the incisors, it may reasonably be inferred, that sooner or later it will make its appearance on all the teeth mentioned. Where this result does not follow, it must be from one of two causes :

1st. That the proximate surfaces of the teeth are not closely in contact, and admit freely the passage of the brush or fluids between.

2d. That the patient, by the exercise of constant care, has kept the surfaces free from all collections.

When decay attacks the incisors at a later period in life, it does not necessarily follow that the surfaces mentioned will be affected.

If, then, this position be true, it becomes a question of serious import whether, if one of the incisors be decayed at this early period, we should

at once proceed to make a separation in the balance to avoid the results almost certain to follow? I understand Dr. A. to answer, "that it is the best practice to make the separation before the progress of the caries has rendered this method of treatment impossible."

While I endorse the fact that caries will attack these anterior teeth, I do not think it advisable to enter at once upon the separation of all the proximate surfaces anterior to the bicuspid. There is always a doubt whether this result will follow, and we should give the teeth the benefit of this doubt, and wait until decay manifests itself. I make exception in the case of these anterior teeth, because they, above all others, are immediately under the supervision of the operator and patient; very few of the latter will permit caries to make any progress before calling the attention of the dentist to the fact. Separation can then be made of the proper form, and the simple cavity filled, producing no disfigurement to the tooth.

The same reasoning and mode of practice does not, it seems to me, hold good with the bicuspids. Further removed from observation, and closely pressed together on their proximate surfaces, the ordinary opportunities for observation are not present.

Without entering into the theories of caries, that have at various times been promulgated, I may say in brief, that the destructive agent, having once effected a lodgment, soon breaks down the tubular structure of the dentine, and that is removed with great rapidity, without a corresponding loss of the hard enamel tissue. This is the process common to all the teeth.

We find in the proximate surfaces of bicuspids, superior and inferior, caries penetrating the teeth at the point of juncture of the surfaces, or slightly above it. It will then pass into the dentine, and very commonly destroy a large interior surface, before either dentist or patient is aware of the fact. To the properly educated eye, this progress of caries is manifested from its first entrance in the dentine, by the slight change of color of the enamel. If this infallible sign were always observed and attended to, there would be but little difficulty in the management of these teeth, but, that it is almost entirely neglected, is patent to all observers. The teeth are allowed to remain until the cavity is exposed by the breaking of the surrounding wall, or the pulp is nearly or entirely exposed, producing pain.

Caries may, however, be present in the enamel and give no indication; indeed, I think it may truthfully be asserted that the majority of patients have these teeth at some stage of disease.

Now, admitting these to be facts, what would seem to be the proper course? Certainly the whole duty of the operator has not been performed

if he neglects to separate these teeth thoroughly before leaving the case. This has been my practice for a long time, and one forced upon me by the observations of experience. Hence, whether the blue tinge be present or not, the teeth are filed freely, fully believing that, if there be no decay, the separation made will go very far to prevent it, and, if it be present, I am equally prepared to meet it.

The objection to filing the bicuspsids, by those who admit their constant liability to decay, is based on the fact that it involves the destruction of so much good tissue, and that this cannot be done without injuring the shape of the tooth at the masticating surface, the mode usually adopted being to remove mainly from the lingual and palatine surfaces, and but little from the buccal. I do not see the force of the objection. That there will be a trifling disfigurement is admitted, but it is almost entirely hidden from view. The advantages derived more than counterbalance this objection.

The other and more important one is, that all filed surfaces are more liable to attacks of caries than those covered by enamel. This would, perhaps, be true in practice, as it seems reasonable in theory, were it not that the fact is well known that an abraded surface of dentine never remains in the condition of a tissue with a series of open-mouthed tubes.

We see this beautifully illustrated in the deposition of secondary tissue in the pulp, as fast as attrition removes the crown in its near approach to that organ. Here the constant but slight irritation renews the formative process, and a further deposition of calcareous particles and the formation of the irregular tissue, called osteo or secondary dentine, takes place. This approximates dentine in its formation, but has none of its regular tubular structure.

Another illustration may be found in the increased deposition of cementum in exostosis, produced by constant irritation. A better illustration may be seen on those masticating surfaces extensively worn by opposing teeth. The surface here presents almost the density and polish of the enamel. The same result is witnessed in the arrestation of caries by the consolidation of the tubes, with their contents, into one solid mass.

Reasoning, therefore, from analogy, all filed surfaces must, to a greater or less extent, partake of a similar character. Consolidation must necessarily take place, opposing any further encroachments of disease, with ordinary care.

If this be admitted, what possible injury can result in the use of the file, if the surface be subsequently properly polished? I have no hesitation in asserting that no evil results can follow.

Having considered some of the objections, what may we hope for in the way of benefits? In the first place, we obviate the danger of excessive

loss of structure, which delay invariably occasions, in these important teeth. We give the patient ample opportunity to free the teeth from all particles of food, secretions, &c. In a word, we insure the teeth for an indefinite future of usefulness. On the other hand, he who neglects them until decay has manifested itself, and some portion of the walls have broken away, has a tooth always unreliable, and one infinitely more of a disfigurement to the mouth.

The rule must be observed to form the spaces of a shape that will not only prevent the proximate surfaces from coming together, but that they may be readily freed from all secretions. To save the appearance of the tooth, the broadest separation must necessarily be made toward the palatine and lingual walls.

The whole process of filing may, and in all probability will, prove a failure, if the finishing process be not performed thoroughly. Any roughness left furnishes a lodgment for the materials necessary to produce the commencement of caries. The same care should be exercised here as in the finishing of fillings, and for the same reason. The most active ingredients in the oral secretions are those microscopic in their character; hence, depressions, however minute they may be, will probably cause a renewal of disease.

THE IRREGULARITIES OF THE CENTRAL INCISORS.

BY WILLIAM M. BEARDSLEE, D. D. S.

In attempting a description of the irregularity of the upper permanent central incisors, I shall describe, 1st, the kinds; 2d, the causes; and, 3d, the treatment.

The deviations of these teeth, from their natural position, are various. The appearance of one of the central incisors behind the corresponding temporary tooth, so that at each closing of the jaws the lower incisors come before it, preventing the deviating tooth from acquiring its normal position.

The appearance of both central incisors before the corresponding temporary teeth, projecting the lip, and producing a great deformity. Frequently they both appear behind the corresponding temporary teeth, and produce the same difficulty as when the one central appeared behind the temporary.

They are frequently turned or twisted on their axis, giving the crown an oblique or transverse direction across the alveolar ridge. Frequently the centrals, as well as all the front teeth, are projected from the mouth, raising the lip, and when the mouth is closed, there is room enough to put one's little finger over the lower front teeth and under the upper.

THE CAUSES OF IRREGULARITY.

The causes of the central incisor appearing behind the corresponding temporary tooth are obvious.

First. The temporary tooth was left to remain in after the permanent commenced to appear, and after it was extracted, there was not room enough between the other central and lateral incisors, to permit it to take its proper position in the circle; even had there been room it could not have acquired its natural position, on account of the lower teeth closing in front of it.

Frequently both permanent centrals appear before the temporary. This can be accounted for, from the fact that the temporary remain in after the permanent appear, and when, after extraction, the laterals may have dropped in under them, still keeping them out of their natural position.

Often the permanent centrals appear behind the temporary. This may be accounted for by the latter having been allowed to remain in after the permanent appeared, and on extracting the temporary, the lower teeth would not allow them to assume their proper place, on account of closing in front of them.

The turning, obliquely, on their axis, may be accounted for from a malformation of the jaw, consequent on a crowding of the back teeth, or the temporary teeth left in may have been irregular, and the permanent being erupted, have appeared between the teeth, and have taken a wrong direction during development, and the back teeth being crowded, have kept them from gaining their natural position.

The projection from the mouth of the central incisors, and all the front teeth, is frequently owing to the pressure exerted by the back teeth.

If we examine the mouth, we may see that one or more of the lower molars is longer than the upper, and may lean towards the anterior part of the mouth; the grinding surface acting as an incline plane for the upper molar to act against, pressing them and all the anterior teeth forward.

Not unfrequently the cause of pressure on the front teeth arises from a lateral contraction of the jaw, producing a V-shaped palatine arch, which pressure causes a crowding of all the front teeth.

The irregularity of the permanent central incisors is frequently accompanied by irregularity of all the front teeth, as well as of the bicuspids and molars.

There are other varieties of irregularity of the central incisors too numerous to mention.

THE TREATMENT.—Where the permanent central incisor appears behind the corresponding temporary, there are several methods to bring it to its natural position.

Dr. Tomes recommends making a plate to fit the palatine arch, and securing it to the teeth by small half bands, and then making a small box to fit on the plate against the palatine surface of the deviating tooth.

In this is next fitted a small piece of compressed wood, which, becoming moistened with the saliva, will expand, forcing the deviating tooth to its proper place.

Another effectual method is, to strike up a plate to fit the arch, and then making half bands on both sides of the bicuspid or molars, and bending a heavy piece of plate over them, and soldering it to the plate and bands. After this a narrow piece of heavy plate is bent around in front of the teeth, and soldered to the bands on the bicuspid. After being adjusted in the mouth, place a piece of rubber or linen thread around the tooth, and draw it tightly, fastening it to the band in front of the deviating tooth.

The rubber will exert a steady contraction, and force the tooth in a short time to its proper position. There is another method preferred by many operators. It consists in striking up a plate to fit over the lower front teeth, and bending a piece of heavy plate so as to form an incline plane for the deviating tooth to strike against.

This will exert a powerful pressure on the deviating tooth when the jaws are closed. The objection to this appliance is, that the patient will soon learn that, by closing the jaws, considerable pain is produced; therefore, it is unavailing in a majority of cases. A very efficient method is to fit half bands on both sides of the bicuspid or molars, and bending a piece of plate over the teeth and soldering it to the band; then, taking a narrow strip of platina gold, bend it around in front of the deviating tooth, and solder to the bands around the bicuspid, so as to form a spring. Next put a ligature around the deviating tooth, and fasten the same to the end of the spring.

A very effectual method for remedying the deformity, in cases where both central incisors appear before the corresponding temporary teeth, is to strike up a plate to fit the palatine arch, and secure it in the mouth by bands around two or more of the back teeth, so as to be firm in the mouth, leaving sufficient space behind the deviating teeth to allow them to be drawn into their proper places, next soldering two small pins on the plate back of the deviating centrals; and after being adjusted to the mouth, pass around the teeth to be moved a ligature of linen thread, or narrow band of rubber, which fasten securely to the pins on the plate.

Frequently the laterals will have to be forced out a little, so as to allow the centrals to come into their proper places. This can be accomplished by placing small boxes on the plate back of the laterals, and then

fitting a piece of compressed wood in the box, which will force out the tooth as it expands.

Where they both appear behind the corresponding temporary teeth, the same appliances can be used as in the treatment of the one tooth under similar conditions.

The kind of irregularity produced from the twisting of the central incisors on their axis is very difficult to treat.

One of the most effectual modes is to wrap a small wire several times around the teeth, and carry it back to the bicuspid, fastening it to bands around these teeth.

Often only a ligature is passed around the deviating tooth, and fastened at each side, so as to exert pressure on both sides of the tooth; one end of this ligature is then carried over the lateral, then back to the bicuspid, where it is fastened. The other end is carried inside the circle, and also fastened to the bicuspid.

When these ligatures are used, they should be renewed every day or two. In treating cases where the centrals, and all the front teeth project from the mouth, arising from pressure exerted by the lower molars, we must remove the causes before we can hope for success. This can be accomplished by passing between the lower molars a piece of rubber, which will force back the molar, and in many cases give room to bring back the upper also.

If not sufficient space is gained in this way, a plate may be fitted to the back of the lower teeth, and secured to them by bands; let the plate extend back of the molars, and solder a couple of pins to it back of them. Next fit a small cap over the anterior corner of the lower molar, so that when the rubber is applied to the rings in the caps, and to the pins on the plate, it will exert a pressure downward and backward.

This will generally press down the teeth so as to allow them to close properly. When this is accomplished, we can proceed to regulate the upper molars, bicuspid and the anterior teeth. First, we will have to press back the upper bicuspid and molar, which have been pressed forward by the lower molars.

This may be done by striking up a plate to fit the arch, and soldering on a narrow piece of platina gold on the back part of the plate, so as to form a spring to press on the anterior proximal surfaces of the teeth to be moved. This being done, we can proceed to regulate the anterior teeth by one of the methods referred to previously.

There are many other methods for regulating the deviations of the central incisors beside those named, and probably quite as efficient, but it is unnecessary to extend the article to greater length in describing the many ingenious appliances adopted by many to affect the same object.

THE RELATIVE LIABILITY OF TEETH TO DECAY.

BY DR. J. M'CALLA, D. D. S.

[We have been favored with the following diagrams, representing the character and number of teeth extracted in over twenty years' practice, by Dr. McCalla, of Lancaster, Pa. The first one, of 12,542 teeth, was prepared several years ago; the second one, bringing up the number to 19,218, was recently arranged.

We should have been glad to have presented them to our readers in the admirable manner in which we received them; but the diagrams sent were intended more especially for the lecture room, and could not well be represented here. We doubt if any such exhibit has ever been made, if we regard both the manner of its presentation, or the number of teeth. It is well worthy careful examination, and will be found not to materially differ from other similar statements, or the experience of every one in actual practice.

It will be observed that the first diagram is arranged for male and female, the teeth being placed as they antagonize in the superior and inferior maxillæ. The second explains itself—it comprises the summing up of the whole.—ED.]

71	157	275	167	190	65	151	143	137	149	78	172	185	332	170	86	Superior.
MALE.																
68	160	370	59	35	13	11	6	6	6	6	28	47	312	203	66	Inferior.
Wisdom.	2d Molar.	1st Molar.	2d Bicuspid.	1st Bicuspid.	Canine.	Lateral.	Central.	Central.	Lateral.	Canine.	1st Bicuspid.	2d Bicuspid.	1st Molar.	2d Molar.	Wisdom.	
144	302	355	332	432	264	408	374	387	414	254	434	401	469	323	144	Superior.
FEMALE.																
141	374	635	179	139	60	43	39	34	38	60	125	160	570	433	155	Inferior.
Right.						[Total, 12,542.]						Left.				

A TABULAR STATEMENT

Of teeth extracted in regular succession, for all causes, and from all classes of society, during a period of over twenty years. The cases amount in all to 19,215, and are so arranged as to show the relative liability to decay; also the relative liability of teeth to decay in the upper and lower jaws, and right and left sides, in both males and females.

The first table presents the total number of each class of teeth removed.

The second shows the number of each kind removed from the right and left sides of the mouth.

The third presents a plan of the mouth, showing the number lost by males and females, in the upper and lower jaws, and right and left sides, during the same period of time.

The fourth exhibits the actual number embraced in each of the divisions named in No. 3.

No. 1.

Central,.....	1,729
Lateral,.....	1,819
Canine,.....	1,216
First Bicuspid,.....	2,297
Second Bicuspid,.....	2,355
First Molar,.....	5,312
Second Molar,.....	3,166
Wisdom,.....	1,327
Total,.....	19,215

No. 2.

RIGHT.		LEFT.	
Central,.....	875	Central,.....	854
Lateral,.....	921	Lateral,.....	898
Canine,.....	615	Canine,.....	601
First Bicuspid,.....	1,172	First Bicuspid,.....	1,125
Second Bicuspid,.....	1,168	Second Bicuspid,.....	1,187
First Molar,.....	2,705	First Molar,.....	2,607
Second Molar,.....	1,515	Second Molar,.....	1,645
Wisdom,.....	646	Wisdom,.....	681
Total,.....	9,617	Total,.....	9,595

No. 3

RIGHT.								LEFT.							
Wisdom.	2d Molar.	1st Molar.	2d Bicuspid.	1st Bicuspid.	Canine.	Lateral.	Central.	Central.	Lateral.	Canine.	1st Bicuspid.	2d Bicuspid.	1st Molar.	2d Molar.	Wisdom.
112	243	448	264	282	107	232	227	203	214	119	255	27	506	243	121
107	250	562	95	54	18	16	9	12	12	10	38	76	493	293	109
FEMALE.															
208	452	757	517	630	402	616	590	591	624	390	646	589	726	483	215
219	570	938	292	206	88	57	49	48	48	82	186	255	882	626	236
															Superior.
															Inferior
															Superior.
															Inferior.

No. 4.

MALE.

Right Superior,.....	1,915	Left Superior,.....	1,928
Right Inferior,.....	1,111	Left Inferior,.....	1,043

5,997

FEMALE.

Right Superior,.....	4,172	Left Superior,.....	4,264
Right Inferior,.....	2,419	Left Inferior,.....	2,363

13,218

Total,.....19,215

LANCASTER, PA.

AN AMERICAN LADY MEDICAL STUDENT IN PARIS.

Miss Putnam, who has lately been admitted to her first medical examination in Paris, is a daughter of the head of the well-known publishing house of Putnam & Son, New York. She went abroad almost without letters, determining, as she expressed it, to stand only on her own feet. Her steady demeanor interested at once persons of influence. While she worked on, utterly innocent that her quiet walk was the theme of observation, the wife of the Minister of Public Instruction watched her narrowly. When the proper time came, this lady asked her husband to open the gates of the University to this one student by the exercise of his authority. It was quite uncertain whether more could be done. Her bearing and success have thrown them open to all women.

Miss Putnam has written some excellent letters on medical topics to American journals since she has been abroad.

Editorial.

TO OUR READERS.

We have not been in the habit of soliciting subscriptions to our journal, but we would remind our readers that the April number closes Vol. VI., No. 4, and we desire that those who wish to take it for the coming year should send in prior to the issuing of the April number.

Our journal is low in price, and within the reach of all. Although not as large as some others, we believe our readers have found it well worth all that it has cost them. We have endeavored, from time to time, to make such improvements as were deemed necessary to render the TIMES valuable in all departments. This we shall continue to do.

The meagre support given to dental journals is certainly disgraceful to the ten thousand men now in practice in this country. Every one of whom, for their own interest, should regularly take at least one of those now published. We therefore request all who may receive this number to renew their subscriptions in good season. We expect to be able, in the future, to furnish full translations of whatever may transpire of interest in the profession in Germany, as we have done in this and previous numbers.

THE STATE CONVENTION.

The call which was issued for a State Convention to meet in Philadelphia, on the first of December, to organize a State Society, was responded to by most of the local societies in the State.

The earnestness and interest manifested by every one present in the proceedings, was an indication that the call was not premature, but that the organization of a central association, in which all parts of the State could be represented, was felt to be an absolute necessity.

The time was mainly occupied in organizing, and preparing a bill to be presented to our next Legislature, to regulate the practice of dentistry in this State.

We greatly fear that many points introduced into the articles of the Constitution will be a source of trouble in the future. In this light we view the establishment of a Board of Censors. Their duties are, in part, to examine the Constitutions and By-Laws of all local societies and colleges represented, that they do not conflict with the rules established by the State Society. It seems to us that the attempt to regulate the rules of colleges is entirely beyond its province, and will ultimately tend to keeping those institutions unrepresented. The strenuous efforts made to

retain this article, was a sure indication that some, at least, supposed it would be a powerful weapon to use in compelling one college to change its rules to correspond to their ideas of right. We are happy, however, to say that if such was the intention, the effort will be barren in result.

Whether the bill to regulate dentistry, as finally adopted, will pass the Legislature or not, it must be apparent that a law, stringent in its requirements, must be adopted, or it will prove a failure. Many will undoubtedly feel its provisions oppressive, but for the good of the profession there should be no factious opposition to its general tenor. It would be impossible to pass any law that would not bear unequally upon some. While perhaps the one adopted might be greatly improved, we think it contains all the provisions necessary for the present time.

The Convention, as a whole, was satisfactory, but we hope at future meetings, immediate surroundings will have less influence than they seemed to have in this: and we hope further, that the annual gatherings may always be held in the interior. While personally we should always be glad to have it meet at our doors, we think a large city, with its antagonizing influences always at work, must ultimately weaken, if not destroy, any organization of the character of this one.

TOOTH BRUSHES.

Our attention has been directed to them by seeing several new varieties in the stores for sale, and some, we think, are decided improvements on the ordinary kind, which is made with the ends of the bristles cut square off. Then there are those with some of the bristles shorter than the others; in these it is only the long bristles that come in use, the shorter ones only acting as supports to the others, and they being square at the ends, will not pass into the interstices on the crowns and between the teeth. The improvement we wish to call attention to is made by pointing the bristles, so that they can be forced readily into every crevice. A brush of this kind is made by Maury & Reaves, and we think it is an improvement on the ordinary kind. Another kind which we noticed is made of soft rubber, the parts intended to answer the purposes of bristles are small cones of rubber, terminating in points, the handle only being made of ivory; whether this kind of a brush can be recommended, we cannot say, as we have never tried them: but we should think, from the size of the cones, that they could not be forced between the teeth so as to cleanse them properly; the only advantage they can have is durability, and this may be an advantage not to be overlooked; for although, in some cases, a tooth brush may be kept and used too long, still this is not the fault to be found with the most of them, as they usually come in pieces in

a very short time, and the principal cause of this is, the bristles are drawn and held in with thread, which soon rots off, or with copper, brass or silver wire, that soon either rust away or destroy the bristles, so that they fall out. If they were drawn with platina wire, which would cost very little more, the brush would last much longer.

We have several other varieties, which we have picked up as curiosities. In some the bristles stand in a certain direction, and in others just the reverse. These are made to suit some peculiar notion of the manufacturer, and it may be our fault in not being able to see any advantages in them. We have one of French manufacture, that has a galvanic battery in the handle, a small strip of copper runs up among the bristles, and close to and parallel another of zinc, and these terminate in a zinc plate in the handle. When the brush was wet, it was supposed that a galvanic current circulated through the bristles, and assisted in cleansing the teeth or stimulating the gums, or, perhaps, by giving a shock, destroy the animalcules or vegetable growths that were at one time thought to produce tartar, and are now charged with causing or hastening the decay of the teeth.

Without attempting to decide on the advantages of any particular kind of tooth brushes in the market, we think every dentist will agree with us that it is essential that some kind of a brush should be used ; for, although a brush alone will not cleanse the teeth thoroughly, still they are indispensable in the process. Nothing affords an operator more pleasure than to have his work come back to him a year or more after he has done it, looking as well and as clean as it did when it passed out of his hands, and nothing annoys him more than to have the patient come back in a short time, with the gums all turgid, and the teeth covered with mucus, and the interstices between them filled with remnants of food in all stages of decay—then to be told that they clean their mouths perfectly three times a day ; and such cases are coming to us almost every day. We hope some one will write an article on the process and importance of thoroughly cleansing the teeth every day.

T. L. B.

REPORT OF SURGEON-GENERAL U. S. A.

We have received this annual report, which contains matter of general interest.

The monthly reports received in this office for the fiscal year, terminating June 30, 1868, represent an average mean strength of 45,257 white, and 4,774 colored troops.

Of the white troops, the total number of cases reported under treatment was one hundred and thirty-one thousand five hundred and eighty-one, (131,581,) or two thousand nine hundred and eight, (2,908,) per thousand

(1000) of strength; nearly three entries on the sick report during the year for each man. Of this number, one hundred and eighteen thousand nine hundred and twenty-five, (118,925,) were for disease alone, and twelve thousand six hundred and fifty-six, (12,656,) for wounds, accidents and injuries. The total number of deaths reported, was one thousand three hundred and fifty-three, (1,353.)

Of the colored troops, the number treated was fourteen thousand six hundred and sixteen, (14,616.) Of this number, thirteen thousand five hundred and fifty, (13,550,) were for disease; one thousand and sixty-six, (1,066,) were for wounds, injuries, &c. The total number of deaths reported, was two hundred and sixty-eight, (268.)

The Army Medical Museum is reported increasing constantly in value and usefulness, a large number of specimens having been added during the present year. Under its present able management, this department promises to become second to none in any country, if, indeed, it has not already reached that position.

Dental Societies.

THE STATE CONVENTION.

The Convention to organize a State Dental Society, met in this city on Tuesday, the 1st of December. Delegates were present from the Pennsylvania Association of Dental Surgeons, Lebanon Valley Dental Association, Odontographic Society, Susquehanna Dental Association, Harrisburg Dental Association, Erie Association, Cumberland Valley, Philadelphia Dental College, and Pennsylvania Dental College.

The attendance was large, and composed of earnest men, anxious to organize for their own improvement and the elevation of the profession.

The Convention met at 10 A. M., and organized by the appointment of Dr. Jno. McCalla, of Lancaster, as temporary President, and Dr. Geo. W. Neidick, of Carlisle, as Secretary.

After the usual preliminaries of a Convention had been gone through with, it was organized permanently by the election of the two gentlemen named, to serve as permanent officers until the adoption of the Constitution and By-Laws of the State Society.

The Committee appointed to prepare a form of Constitution, made a report which occupied the consideration of the Convention the entire day, and a portion of the morning session on Wednesday.

After its adoption as a whole, the delegates signed the document, and organized as a State Society.

The election for permanent officers, resulted in the choice of Dr. A. B. Robbins, Meadville, President; Dr. J. L. Suesserott, Chambersburg, 1st Vice-President; Dr. Samuel Welchens, Lancaster, 2d Vice-President;

Dr. George W. Neidick, Carlisle, Recording Secretary; Dr. Thomas C. Stellwagen, Philadelphia, Corresponding Secretary; Dr. John McCalla, Lancaster, Treasurer. Board of Censors—Dr. J. H. McQuillen, Philadelphia; Dr. James Truman, Philadelphia; Dr. H. Gerhart, Lewisburg; Dr. J. G. Templeton, New Castle; J. W. Moffitt, Harrisburg.

After the formal induction of the President elect to the chair, and brief remarks by him, the Committee to whom was referred the preparation of a bill to regulate dental practice in the State, made their report, the consideration of which occupied the largest portion of the afternoon session.

This document, as finally adopted, is stringent in its requirements, obliging all dentists to either pass an examination, or graduate at a dental college before January, 1871. As it was presented in a somewhat crude form, we have not thought it best to give it to our readers, as it will require careful legal revision before its presentation can be made to the Legislature.

After the appointment of an Executive Committee, and a Committee on Publication, the Society adjourned, to meet at Harrisburg on the first Tuesday in June, 1869.

J. T.

Book Notices.

We received, a few days since, the *Physician's Medical Compend and Pharmaceutical Formulæ*, compiled by Edward H. Hance, and published by Hance, Griffith & Co., of this city. As the author states, "this work is designed to present, in a compact form, and convenient for ready reference, information valuable to the pharmacist and physician." The first division of the book is designed more especially for the use of apothecaries and physicians; still the dentists may derive much benefit by having a work of this kind at hand, as a great number of preparations and formulæ are given, and the ordinary dose of the preparations. The second part of the work, entitled "*Materia Medica*," is compiled from the U. S. Dispensatory and other standard works. It gives merely the name of the remedy, some of its properties, as astringent, stimulant, tonic, &c., and the dose. In another place the antidotes and treatment for poisons are given, and the abbreviations and symbols used in writing prescriptions. This little work will be found very useful to refer to in cases where the exact formula is not remembered. It is not intended, nor will it supply the place of larger works on Pharmacy or *Materia Medica*, but as a work of reference, we can recommend it, and being bound in soft binding, with tuck, can very conveniently be carried in the pocket.

T. L. B.

Correspondence.

NOTICE TO DELEGATES TO AMERICAN DENTAL ASSOCIATION.

ST. LOUIS, MO., December 22, 1868.

EDITORS "DENTAL TIMES"—*Gentlemen*:—By resolution of the American Dental Association, convened in July last, the Secretary was instructed to cause to be published in the dental journals, the following form of certificate, to be presented to that body by delegates:

"This certifies that _____ was duly appointed a delegate to the American Dental Association, on the _____ day of _____, 18—, by the Dental Society of _____, and that said _____ is a dentist of good character and standing, and at this time in regular practice."

Please, therefore, give this place in your columns. Respectfully,

EDGAR PARK,

Recording Secretary American Dental Association.

Selections.

CARBOLIC ACID AS A POISON.

BY JOSEPH G. PINKHAM, A. M., M. D., OF LYNN, MASS.

Professor of Chemistry and Toxicology in Berkshire Medical College.

Carbolic acid may now be fairly said to have passed the period of its probation, and to have taken its place among the standard articles of the *materia medica*. Although long known to chemists, it is only within a very few years that its valuable properties as an antiseptic, disinfectant, parasiticide and caustic, have been recognized and understood by the medical profession. That it has rapidly come into general favor, the following brief enumeration of its principal uses will show: It is employed for embalming the bodies of the dead; for preserving anatomical specimens; for the treatment of primary syphilis, mucous tubercles, carbuncle, quinsy, diphtheria and ulcerations of the cervix uteri; as a dressing for burns, fresh wounds, and foetid, purulent sores; as a parasiticide and anti-pruritic remedy in certain cutaneous affections; as a disinfectant for hospital wards, privies, sewers and clothing; as a preventive of contagion in cases of typhus, cholera, the cattle plague, and other infectious diseases; and even as an internal remedy in obstinate vomiting, chronic diarrhoea, spasmodic asthma, phthisis pulmonalis, chronic bronchitis and malignant fevers. Much undoubtedly remains to be learned, both in regard to its therapeutic virtues and the dangers arising from its misuse; yet time and the results of future investigations can only modify, not wholly destroy the popularity it has so quickly attained.

Like all other potent medicines, it is capable of acting as a poison. F. CRACE CALVERT, to whom is chiefly due the credit of having first brought this substance prominently into notice as a medicinal agent, says,

(as quoted by Dr. CALDWELL in the *Boston Medical and Surgical Journal* for July 2d, 1868,) "The great advantage which carbolic acid possesses over all other antiseptics, is, that it cannot be used for any illegal purposes, as arsenic or corrosive sublimate may." It is difficult to understand the ground for this assertion. Several fatal cases of accidental poisoning by carbolic acid are already on record, and one not fatal has come under my own cognizance. Indeed, this poison seems not inferior in power and rapidity of action to oxalic acid, and hardly so to strychnine, while a much smaller quantity than of the former is required to produce a fatal result.

In view of these facts, I have thought that a consideration of the subject from a toxicological stand point, might be of some value to the profession. It certainly becomes us, who use as medicinal agents drugs potent for evil, to study well their nature and powers, that we may guard, in every possible way, against the occurrence of accidents.

A full account of any substance, as a poison, would embrace a description of

1. Its physical and chemical properties.
2. The methods of separating it from organic mixtures as a preliminary to the application of chemical tests.
3. Its toxical effects upon the system, with the symptoms and post mortem appearances involved.
4. Its antidotes.
5. The medico-legal evidence of poisoning by its use.

This scheme I propose to follow, even at the risk of repeating, under the first division of the subject, much that has been said before. The drug is so new to the profession that it may not be necessary to offer an apology for doing what, in the case of a substance better known, would be simply a work of supererogation.

I. PHYSICAL AND CHEMICAL PROPERTIES.

Pure carbolic acid ($\text{H C}_6 \text{H}_{50}$) is found in commerce in two forms, a glacial or crystalline and a liquid form. Glacial carbolic acid is a colorless solid, of low specific gravity, consisting of broken acicular crystals, which melt at a temperature of 95°F. , and become liquid on the addition of a small quantity of water. Liquid carbolic acid has a specific gravity of 1.065, is easily volatilized, and boils at a temperature of 359°F. When pure, it is colorless, but as usually seen, its color is a light pinkish-brown. Its odor resembles that of creasote, but is less penetrating and disagreeable. Its taste is hot and pungent. When brought in contact with the tissues of the body, it acts as a caustic, producing a white slough. Its vapor also powerfully attacks the mucous membrane of the eyes, nose and lips.

Carbolic acid coagulates albumen, gluten, and caseine. It is called an acid, but it belongs more properly among the alcohols. It does not redden blue litmus paper, and the compounds it forms with bases, even those the most powerful, are unstable. With sulphuric acid it unites, forming a colligated acid. It forms with water a crystallizable hydrate, soluble in water and alcohol. Its compound with potassa, potassic carbolate, is a colorless crystallizable substance, easily decomposed by heat and the acids, which might possibly prove a valuable substitute for potassic hydrate as a caustic.

Carbolic acid dissolves in all proportions in alcohol, ether, glycerine, the fixed oils, and strong acetic acid. In regard to its behavior with water, authorities differ. My own observations lead me to the following conclusions:

1. With twenty times its weight of water (the minimum) carbolic acid forms a solution, or, more properly speaking, a permanent emulsion.

2. With twelve times its weight of water, it forms, on agitation, a temporary emulsion, which, for all practical purposes, is equivalent to a solution.

The taste of the aqueous preparations and of dilute solutions in certain other menstrua, is warm, and not unpleasant, while the odor is feeble. The impure acid, sold chiefly for disinfecting purposes, is of various degrees of strength and purity. Its color is dark, and its odor much more marked than that of the pure acid. It may be well, at this point, to state that several preparations of different strength have been sold in the market under the name of "saturated solution of carbolic acid." To avoid mistakes, it would be well for physicians, when prescribing the drug for medicinal purposes, to write for the pure acid, dictating the menstruum if a solution be required. Carbolic acid is known by several different names, as phenol—more appropriate by far than the one it now generally bears—phenylic alcohol, phenylic acid, phenic acid, hydrate of phenyl, &c. It occurs in coal tar, associated with creasote, and the two have often been mistaken, the one for the other. Cresylic acid, a substance also found in coal tar, resembles carbolic acid in properties, and has been considered by some identical with it. Williamson regards it as a distinct compound, and gives its formula as $\text{H C}_7 \text{H}_7 \text{O}$.

Carbolic acid may be recognized by its odor, by its action on the animal tissues, by its behavior with water, and by the following chemical test:

A splinter of deal, dipped first into the acid, and then into strong nitric or hydrochloric acid, will become blue on drying.

II. SEPARATION FROM ORGANIC MIXTURES.

The separation of carbolic acid from organic mixtures, as in the case of other destructible organic compounds, is always a difficult, and sometimes an impossible task.

The proper method of proceeding would be as follows: Cut up the solid portions of the mixture into fine pieces, add a large proportion of warm distilled water, and agitate with a glass rod; let the whole stand for several hours, with occasional stirrings; filter through fine paper, and distill, taking care that as the process is nearing completion, the heat be not great enough to clear the non-volatile organic residue. It would be better to make use of a water bath, by which means the danger of clearing away may be completely avoided. Add calcic chloride to the distillate, and re-distill after the manner of concentrating alcohol. By these means the acid may be obtained sufficiently pure for recognition. The greatest care and skill are requisite, and even with them, the experiment may fail, especially if all the poison had been absorbed into the circulation before death. If a portion has remained unabsorbed, its recognition is less difficult. All the customary precautions enjoined in such operations should be observed.

III. TOXICAL EFFECTS UPON THE SYSTEM.

Carbolic acid operates as a poison both before and after its absorption into the circulation. Before absorption it acts as a caustic or simple irritant, according as the preparation employed is strong or weak. When pure, or in strong solution, it coagulates the albuminous portions of the tissues, thus preventing or retarding the process of absorption. The usual symptoms of corrosive poisoning attend this action. They are, however, less marked than with most other corrosives, owing partly to the fact that carbolic acid acts as a local sedative, in this way diminishing the pain, and partly to the speedy occurrence of general symptoms, which to a great extent mark the local ones. Spasmodic stricture of the œsophagus is a common occurrence when the strong acid has been given per os. Owing to this fact vomiting is not likely to take place. Weak solutions produce no local effect except irritation; but as they are more rapidly and completely absorbed, the ultimate effect may be more dangerous.

After absorption the drug acts directly upon the nervous centres, causing headache, giddiness, trembling, convulsions, insensibility, stertorous breathing, contracted or dilated pupil, a rapid intermittent pulse, excessive prostration and death. The surface of the body is usually pale, and bathed in cold perspiration. When the quantity taken is large, death may occur almost immediately from an overwhelming impression on the system, as in the case of oxalic and hydrocyanic acids. In auricles death seems due to a suspension of respiration from tonic spasm of the muscles concerned in the process, or from muscular exhaustion caused by a long continued and rapid succession of clonic spasms. A prominent symptom is the profound insensibility which comes on in a very short time after the ingestion of the poison. Where death does not result from the general action of the poison, it may occur after a time, from the severity of the local lesions. Carbolic acid is quickly absorbed, and quickly eliminated from the system. This fact is proved by the speedy occurrence of general symptoms after its administration, and the speedy recovery when the result is not fatal. The kidneys are the great agents of elimination, but there is good reason to believe that the skin, lungs and intestinal mucous membrane may also take part in the process. A portion of the poison is undoubtedly destroyed in the system, and another portion eliminated unchanged.

Post-mortem appearances.—The local lesions discovered after death are such as we would naturally expect to find from the caustic and irritant action of the poison. The strong acid causes the mucous membrane of the mouth, œsophagus and stomach to become hard, white and corrugated.

The corrugation results from the contraction of the muscles in the walls of these organs. The several evidences of inflammatory action in its various stages may be observed. Congestion of the cerebral and spinal meninges has been noticed in animals, but it is not a constant phenomenon. The lungs are often engorged, and the heart is sometimes empty and flabby, sometimes distended with blood. The kidneys may be much congested, and the bladder distended with urine. In confirmation and further elucidation of the statements here made, I subjoin below an abstract of several reported cases of poisoning with carbolic acid, and an account of some experiments on animals, performed for the purpose of gaining information on this subject.

REPORTS OF CASES.

Case I. The following account is given from memory, as the gentleman who has the notes of the case is now absent in Europe :

Miss A. L., a young lady, twenty years of age, was troubled exceedingly with ascarides, which, not content with their normal habitat, the rectum, kept migrating into the vagina, where they occasioned a distressing pruritus. Having tried, without avail, all the ordinary remedies, she took, on recommendation as a *dernier resort*, an enema of carbolic acid dissolved in glycerine. The amount taken was large, I think about 145 grains. Alarming symptoms came on almost immediately, and medical aid being near at hand, reached her in a few minutes. When first seen by the physician in attendance, she was in the act of falling from her seat to the floor. She rapidly became convulsed, delirious, and finally nearly or quite insensible. The surface was cold and moist, the pulse weak and flickering, pupils contracted and breathing stertorous. The case must inevitably have terminated fatally without the prompt and efficient treatment which it received. Free injections of milk were given, and the sphincter aniruptured to facilitate the discharge of the liquid. In this way the rectum was thoroughly washed out in a short space of time. The constitutional symptoms were, at the same time, combatted by ammonia, camphor and other diffusible stimulants. In about fifteen or twenty minutes a copious flow of limpid, colorless urine came on, which lasted several hours. The exact amount of urine passed was not ascertained, but it must have been enormous. Its odor was slight but peculiar, not that of carbolic acid, nor that of normal urine. No chemical examination was made. Under the treatment the patient soon began to amend, and when I first saw her, some two hours or more after the injection had been taken, she was reclining upon a sofa, with a flushed countenance, seeming very weak and in some pain, but perfectly conscious. A severe rectitis followed, which was readily controlled by appropriate treatment, and in a few days the patient was entirely recovered. It is well to remark that the ascarides were effectually destroyed.

Case II. Reported by Mr. Frederick Sutton, in the *Medical Times and Gazette*, for April 25th, 1868 :

S. C., aged 43, took, instead of a dose of black draught, one ounce of carbolic acid, which was kept in the wards for disinfecting purposes. Seen within five minutes after the poison was taken. She was reclining in a chair insensible; pupils contracted; face blanched and bathed in perspiration; pulse 100 per minute, feeble and very intermittent; respiration stertorous, and smelling strongly of the fluid. There was slight lividity of the lips and tips of the fingers. She rapidly became worse, and died within an hour and a half after taking the poison, the body becoming much swollen before death. Spasmodic stricture of the œsophagus prevented the patient from swallowing, and caused great difficulty in introducing the tube of the stomach pump.

Autopsy seventeen hours after death. At the angles of the mouth the skin was rather discolored and shriveled; the interior of the mouth was very white; tongue dry and chippy; the mucous membrane of the œsophagus was dry, and shrunken, and of a brownish color. The stomach contained about a pint and a half of partly digested food. The mucous membrane could be readily peeled from the walls of the stomach; there

were several dry, white patches on the surface of the rugæ, and the whole interior of the stomach was slightly inflamed. The walls of the duodenum were similarly affected, though in a slighter degree. There were all the morbid appearances that could be fairly attributed to the action of poison.

Case III. Reported by Professor Taylor, in the Guy's Hospital Reports for 1868:

A child aged one year and nine months, swallowed two teaspoonfuls of the ordinary dark-colored acid. Seen ten minutes after the poison was taken. When admitted into the hospital, the child lay in its father's arms, insensible to all external objects: but in a short time it recovered itself. The pupils were contracted and insensible to light. Pulse 120 per minute, and very weak; could be counted with great difficulty. There was a strong tarry odor to the breath; the respiration was much impeded; the surface was cold and clammy, the face pale and covered with cold perspiration. An emetic was given, but owing to spasmodic stricture of the walls of the œsophagus, the patient was unable to swallow, and it was returned through the nose. Tracheotomy was performed, and the little patient obtained some relief, but sank away and died at the end of twelve hours. The post-mortem appearances were similar to those detailed in the foregoing case, except that the stomach did not present such marked evidences of inflammatory action. Death seemed to result from the local action of the acid upon the respiratory passages.

Case IV. Reported by E. S. Machin, Esq., in the *British Medical Journal* for March 7th, 1868:

Three persons in the work-house were dressed with carbolic acid instead of sulphuric lotion, for the itch. The patients were women, aged respectively 23, 60 and 68 years. The acid had been applied to the entire surface. A few moments afterwards they complained of headache; after which they were taken with giddiness, and rapidly became insensible. The girl, aged 23, and the mother, aged 60, died in the course of forty hours. The third patient rallied in about four hours, and recovered after a few days. No autopsy in the fatal cases. The acid used was Calvert's carbolic acid for disinfecting purposes, and was in appearance dark and oily. About six ounces were used in dressing the three cases.

Remarks on the Foregoing Cases.—It will be observed that in all but the first of these cases the crude, or impure carbolic acid was employed. On this account the effects may have been somewhat more complicated, yet they agree in detail essentially. In each case the patient became unconscious very speedily after poisoning occurred. In each case there was great depression of the vital energies, with its various concomitants. Muscular spasms are not noted in any case but the first. The absence in the others may have been due to the large quantity of the poison used, and the powerful sedative following it.

EXPERIMENTS ON ANIMALS.

Experiment I.—Mouse. One minim of the pure liquid acid, dissolved in water, was injected under the skin, over the thorax. The animal ran about, giving signals of pain immediately. In thirty minutes he fell over on his side, making rapid movements backwards and forwards with his legs. These movements continued ninety seconds, and then ceased, the animal simply gasping. In thirty seconds more he was dead. Autopsy twenty minutes after death. Liquid all absorbed. Diffuse redness under the skin in the neighborhood of the injection. No other morbid appearance.

Experiment II.—Rat. Weight of the animal, eight ounces. Injected one minim of the pure liquid acid, dissolved in water, under the skin over the shoulder. Remains quiet.

In 2 minutes. Trembles violently.

5 m. Falls over on side in convulsions, a rapid succession of contractions and relaxations of the muscles of the legs and body, passing in waves from head to tail; once in about three seconds a general spasm, bending the body backward, and throwing out the legs. Some of the general spasms double. Animal apparently unconscious.

15 m. Spasms somewhat less violent. Gives no sign of pain, and makes no motion whatever when the eyeball is touched with the point of a pin. No motion of lips or tail.

20 m. Same condition.

25 m. Gives some evidence of returning consciousness, moves tail, and seems trying to rise. Spasms as before.

30 m. Same condition.

35 m. Winks partially when anything is brought in contact with or even near the eye. Spasms continue.

43 m. Spasms less violent. Struggles to rise. Has been held in hand for last twenty minutes.

48 m. When placed on his side on the floor, rolls over on his belly, but cannot stand.

50 m. More decided evidences of returning consciousness. Crawls along a little.

52 m. Dies suddenly, with two general tremors. No gasping.

Autopsy, 2 hours and 30 minutes after death. Membranes of cerebrum and cerebellum much congested. Blood extravasated beneath the arachnoid. Other portions of the encephalon normal. The upper portion of the spinal cord also shows congestion of the meninges, very marked in spots, and diminishing gradually downward. Lungs engorged. Right side of heart, both cavities distended with venous blood. Pulmonary arteries ditto. Left side of heart partially filled with dark blood. Kidneys congested. Other viscera normal. At the point of injection there was a flat hard lump about eight lines in breadth, and two in thickness. The tissues around were highly inflamed.*

Experiment III.—Small cat. Eighty minims of the pure liquid acid were thrown into the stomach, by means of a small glass syringe and an elastic catheter. The animal, when released, ran rapidly around the room, and then became quiet, crouching down in the corner.

2½ m. Trembles. Seems trying to vomit.

5 m. Falls over partially on one side. Muscles of whole body twitch spasmodically. Opens and shuts mouth. Appears totally unconscious.

7 m. Spasms more violent. Affect particularly the muscles of the legs and the sides of the body. One succeeds the other rapidly, but irregularly. Respiration stertorous. Pupils dilated and responding only feebly to light. Observe an occasional general spasm like those described in Experiment II.

*This animal seemed dull and exhausted when the poison was administered. He may have been injured about the head and neck in the trap, although no marks of violence appeared either externally or under the skin of those regions. Owing to this uncertainty, however, I have attached less weight to the morbid appearances after death than I otherwise should.

20 m. General spasms fifteen per minute, feeble. Other symptoms as before, except that the pupils are totally insensible to light.

From this time, for upward of half an hour, the symptoms remained constant, the animal growing weaker, the partial spasms becoming less, and the general spasms more marked.

65 m. Noise in throat ceases. Breathes quietly.

80 m. Spasms very feeble. Respiration convulsive, with a gurgling noise at each breath.

82½ m. Spasms cease. Gasps. Ten respirations per minute, and growing less frequent.

84 m. Dies.

Autopsy, twelve hours after death. The body was kept in the interval on an inclined plane, prone, with the head elevated. Mucous membrane of the œsophagus white, hard, and wrinkled longitudinally. So firmly were the walls of the œsophagus contracted in its central portion, that a small probe could be with difficulty introduced. Stomach filled with food. Mucous membrane eroded in irregular patches, with hard, dark margins. Some portions simply reddened, others hardened, wrinkled and turned white. Intestines unaffected. Heart, left side filled with black blood, right side nearly empty. Trachea somewhat reddened. Lungs healthy. Kidneys very highly engorged with blood. Brain normal. All parts of the body smell strongly of the acid.

Experiment IV.—Mouse. Two-thirds of a minim of the liquid acid was dissolved in water, and injected into the rectum. Ran rapidly around for a few seconds, and then remained quiet.

1½ m. Trembles violently. Crouched down on belly. Cannot stand.

2 m. Still trembling. Conjunctiva insensible. Totally unconscious.

3 m. Lying on one side in rapid convulsions, similar to those described in the previous experiments, but more rapid.

4 m. Movements growing more feeble and less frequent.

5½ m. Movements ceased. Only gasps.

6 m. Dies.

Autopsy, immediately. Opened thorax. Heart pulsated feebly, perhaps from being twitched with the point of the knife. Ceased immediately to respond to such stimulus. No morbid appearances.

Experiment V.—Mouse. One-fourth of a minim of the pure acid was injected under the skin.

1½ m. Trembles slightly.

2½ m. Trembles violently. Remains on feet, and is conscious.

2¾ m. Falls on side in convulsions. Conjunctiva still sensible.

5 m. Conjunctiva insensible. Convulsions very rapid.

20 m. A little weaker; otherwise as before.

22 m. Seems struggling to rise. Consciousness returning.

25 m. Tries to walk when placed on feet, but cannot stand long.

28 m. Squeals. Tries to escape from a touch, but does not appear to see. Less control over the hind than the fore-legs. Whirls around when trying to advance.

60 m. Squeals almost constantly.

75 m. Spasms ceasing. Only trembles. Is able to stand and walk.

90 m. Falls over on side, and cannot rise. Left struggling.

135 m. Found apparently well, but rather dull.

245 m. Well as ever. Has been eating meal and drinking water.

Experiment VI.—Same mouse, sixteen hours after experiment. Injected $\frac{1}{2}$ minim dissolved in water, under the skin. Death took place in 30 minutes, with symptoms precisely like those detailed in the other cases. *Autopsy* immediately. No morbid appearances of note. Heart responds to irritation, throbbing under it for five minutes after death.

The remaining experiments, eight in number, developed nothing of importance that had not been exhibited by the others. In one case the heart was observed to throb for several seconds after all other motions had apparently ceased. In several instances there was found a post-mortem congestion of the kidneys, and in one the bladder was distended with urine. The cerebral and spinal meninges often appeared engorged to an unnatural extent, but in no other case was this condition nearly as strongly marked as in Experiment II.

Remarks on the Experiments.—Although the observed effects of a drug upon the lower animals are not always precisely *identical* with those on man, yet we seldom see any very wide discrepancy. It will be noticed that there is a striking similarity between the results of the experiments and the reported cases. One doubtful point may be considered as settled by the former; and that is, that carbolic acid produces convulsions when taken in poisonous doses.

IV. ANTIDOTES.

In the treatment of poisoning with carbolic acid, we are obliged to rely chiefly upon measures of evacuation and stimulation. There is no known chemical antidote of value. Owing to the weak affinities, the acid forms no stable chemical combination. The white of eggs, milk and flour paste are of some use, serving, in a measure, to prevent the rapid absorption of the poison, and giving time for evacuation. When the strong acid has been taken into the stomach, the œsophagus is usually so contracted as to make the use of emetics and the pump difficult, or impossible. In case of rectal poisoning, too much importance cannot be attached to the rupture of the sphincter ani. This measure of treatment was, as far as I am aware, first recommended to the profession by my eminent friend, Prof. H. R. Storer, M. D., of Boston. The general symptoms may be combated by ammonia, camphor, musk, and other stimulants of like nature, and by friction and dry heat. Chloroform, morphine and belladonna, only render death more speedy and certain. This is without doubt true of the other powerful neurotics. There is probably no specific dynamical antidote for carbolic acid, if, indeed, there is such an antidote for any poison. After the general symptoms have passed away, brandy, nourishing food, and local antiphlogistic measures may be resorted to, if necessary.

V. MEDICO-LEGAL EVIDENCES OF POISONING WITH CARBOLIC ACID.

These may be enumerated as follows:

1. The detection of the poison in the body by physical and chemical tests.
2. The nature of the symptoms and post-mortem appearances.
3. The preservation of the body.

The detection of the poison in the body is the only conclusive evidence, in itself, of poisoning with carbolic acid. As we have seen before, this is no easy task in many instances. The odor of the acid about the body would be likely to direct attention to it, especially if a large quantity had

been used. Of the symptoms, the most distinctive are the profound insensibility, trembling and muscular spasms, and the great prostration. The post-mortem appearances, other than the local, are of little value. The preservation of the body is a point of considerable importance. It has been fully shown by competent observers, that, when the surface of a corpse is washed, and the natural cavities injected with carbolic acid, the process of decay is prevented. If the acid were actually taken into the circulation, and carried into every tissue of the body, its effect could hardly be less striking. One of the mice poisoned three weeks ago with one minimum of carbolic acid has been kept since then in the house in a warm place, and there is now no sign whatever of putrefactive change. Preservation of the body would therefore be strong presumptive or confirmatory proof of the poisoning by carbolic acid.

RECAPITULATION OF LEADING POINTS.

1. Carbolic acid is a dangerous poison.
2. It is rapidly absorbed into the system.
3. It is rapidly eliminated from the system, chiefly by the kidneys, but probably, to some extent, also by the other emunctories.
4. The local action of the poison is that of a caustic, irritant, and sedative.
5. Its general action is that of a powerful neurotic, causing trembling, convulsions, giddiness, headache, insensibility, a cold, clammy surface, a feeble, intermittent rapid pulse, great prostration, death.
6. Recovery in non-fatal cases is speedy and complete, when there has been no serious local lesion.
7. The post mortem appearances are neither constant nor distinctive.
8. There is no known chemical or other antidote of value.
9. In treatment the chief reliance must be placed upon measures of evacuation and stimulation.
10. Aside from the actual detection of the poison in the body, preservation of the body is the most important medico-legal evidence of poisoning with carbolic acid.—*Medical and Surgical Reporter*.

DR. COHNHEIM, Virchow's assistant in Berlin, has been appointed Professor of Pathological Anatomy at Kiel; Dr. Herman, of Berlin, Professor at Wurzburg, and Dr. Fischer, of Berlin, Professor of Surgery at Breslau.

NEWBERN, N. C., August 17th, 1868.

We would call your attention to a discovery in Anæsthesia whereby Chloroform can be administered without danger.

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It produces anæsthesia in as short a time as gas; the patient recovers as readily, and is free of the bad effects usual after the administration of Chloroform.

The quantity given, about one-twentieth the usual amount, is so small as to render its expense almost nothing.

We will furnish you with explicit directions for administering Chloroform by our method, on receipt of five dollars.

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PLASTIC FUSIBLE METAL.—For RUBBER SOLDER, Mechanical Dentistry, &c.—(Patented March 20, 1860)—\$1 an ounce; put up in 1 oz. and $\frac{1}{2}$ oz. ingots. This is not intended for filling teeth, requiring too high a heat, &c; it is designated from the "Filling" by the patent mark, bearing only the date "March 20, 1860."

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Mercury Gauge, for use in mixing up Amalgam, 25 cents.

Amalgam or Filling Measure, with one cup, 75 cts.; with two cups, \$1.

Postage extra—On material, 9 cts. an ounce; on instruments, 3 cts. each.

For full particulars, and directions for using, send for a circular.

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It is economical, compared with other amalgams of less price; an ounce of this will go farther, by one-third, than any other amalgam, as it can be worked longer without losing its plasticity, so that less of it will be wasted in using it. It costs but one cent more on each filling than the cheap, poor articles. It requires less mercury than any other amalgam in use, and becomes harder in a shorter time.

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N. B.—The superior quality of this amalgam has induced unprincipled men to counterfeit it. A miserable, poor article, claiming to be "WALKER'S EXCELSIOR AMALGAM," has been traced to parties in Brooklyn, N. Y. The *Genuine Amalgam* hereafter will have our Monogram Trade Mark and Signature on the brown envelope inside. [Refuse all others. Buy of responsible parties, or order from the manufacturer.]

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PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Thirteenth Annual Session, 1868-'69.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation,

and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

ANATOMY AND SURGERY.

The instruction in this department will embrace a plain and comprehensive view of the structure of the human body. The lectures and the demonstrations will be given over *the dead body dissected for the express purpose* of elucidating the subject. With the same object, vivisections on the lower animals, while under the influence of an Anæsthetic Agent, will be employed. Such description of the comparative anatomy, microscopical structure and connections of the teeth, as their importance may demand, will be fully given. The valuable and extensive collections of Anatomical Preparations of the incumbent of this chair, consisting of wet and dried specimens, papier mache manikins, models in wood, and accurate French plates, will enable him to illustrate his course of lectures very clearly.

In addition to the above course, a Surgical Clinic will be held by Doctor Forbes during every week, for the purpose of performing such operations in oral and general Surgery as may be deemed advisable to advance the student in this particular branch of knowledge. The cases will be selected from a dispensary which the Faculty have established.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical peculiarities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND HYGIENE.

The intention of the course on PHYSIOLOGY AND HYGIENE will be to convey a knowledge of the essential principles of general and human physiology, in such a mode as will best develop their application to the preservation of health. The subjects of physiology and hygiene will be, to some extent, interwoven, with a constant aim at clearness and simplicity of instruction.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the Demonstrators.

IN THE OPERATIVE DEPARTMENT.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

IN THE MECHANICAL DEPARTMENT.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

PRACTICAL ANATOMY.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

HOSPITAL CLINICS.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

FEES.

Matriculation, (paid but once,) - - - - -	\$5 00
For the Course, (Demonstrator's ticket included,) - - - - -	100 00
Diploma, - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Leidy's or Gray's Anatomy; Carpenter's or Kirk's Physiology; United States Dispensatory; Pereira's, Biddle's or Stille's Therapeutics; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Physiological Chemistry; Hartshorne's Principles and Practice of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the subject.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before

the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

CANDIDATES FOR GRADUATION WHO HAVE NOT ATTENDED LECTURES.—Dentists who have been in continued practice since 1852, are eligible to be candidates for graduation without attendance on lectures. The candidate for graduation must present satisfactory evidence of his having been in practice for the allotted time, also of his good standing in the profession. He must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must undergo a satisfactory examination by the Faculty, on each of the branches taught by them; when, if qualified, he shall be recommended to the Board of Trustees, and if approved, shall receive the degree of Doctor of Dental Surgery. Of this class of graduates, the matriculation and diploma fees only are required.

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THE
DENTAL TIMES.

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Original.

ADMINISTRATION OF NITROUS OXIDE GAS FOR ANÆSTHESIA.

BY FRANKLIN R. THOMAS, D. D. S.

It is my purpose, in writing on this subject, to confine my thoughts more particularly to the administration of nitrous oxide, but presume it would be proper to give a brief synopsis of its career since the discovery was made that it possessed anæsthetic properties. It was discovered by Dr. Horace Wells, a dentist, in 1844, while in attendance upon a public exhibition of its exhilarating character; but he, not being familiar with its administration, did not succeed in his effort to introduce it. Consequently it soon went into disrepute, and comparatively little was heard of it until the year 1863, when the subject was again agitated, and since that period its reputation has been firmly established, and it now occupies a position for safety, and absence of unpleasant after-effects, unequalled by any other anæsthetic in use at the present time.

As will be seen by the perusal of this article, I have, perhaps, differed a little in opinion with some eminent practitioners and writers in the manner in which nitrous oxide should be administered, at the same time entertaining the highest respect and honor for those who have given this subject their special attention and study, that the profession and suffering humanity may alike be benefited, and also, that it may advance on scientific and judicious principles. I cannot but entertain hopes that this will be received simply as an opinion, expressed from conscientious convictions, confirmed by extended experiments and careful investigation.

I think it would be superfluous, in writing on this subject, to dwell in detail on the manner in which nitrous oxide is generated. Consequently, I shall simply make a few very brief statements concerning this particular portion of my subject.

Nitrous oxide, or the protoxide of nitrogen, has for its symbol, in chemical nomenclature, "N. O." Eq. 22. It is generated, for anæsthetic uses, from the nitrate of ammonia, by the application of a sufficient amount of heat to cause it to volatilize—care being required not to apply it in excess, as it is said to generate nitric oxide, or the deutoxide of nitrogen. This being a more poisonous compound in its nature, is generally admitted to be a dangerous mixture. Moreover, any impurities contained in the gas would not obtain the proper amount of absorption, in consequence of its rapid passage in the process of washing. The gas should not be used immediately after it is made, but should be allowed to stand over water at least six hours, that the water may have a sufficient amount of time to absorb any impurities contained in the gas. It will also impart to it a much more agreeable and pleasant taste, besides operating much more agreeably in its anæsthetic effects.

THE DEGENERATION OF NITROUS OXIDE GAS BY AGE.

In regard to nitrous oxide gas being degenerated by its age, there seems to exist considerable difference, and even *direct* opposition of opinion—some claiming that it is *more* agreeable and successful in its effects after it has been standing over water *several weeks*, than when it is fresh. So far as my experiments have demonstrated, I must confess that I believe nitrous oxide gas to be *comparatively weak* when it has been kept *over four days*, to the *extent* that it requires a much *greater* quantity to produce anæsthesia; and, in some instances when *above* that, I have known patients to breathe it almost with impunity, producing scarcely any greater effect than to partially intoxicate. This having been demonstrated by experiments, repeatedly, with gas above this age, I cannot but feel convinced that it is a mistaken theory that nitrous oxide improves by age. I have never had an opportunity to experiment with it when it has been standing three or four weeks, from the fact that if we failed to consume the quantity of gas in the gasometer in four days, we have *universally thrown it away*, deeming it worthless, and hazardous to attempt to produce anæsthesia with it. My earnest convictions in reference to this particular portion of my subject are, that it does, to a very *great extent*, lose its potency, and, to avoid the mortification of *occasional* failures to induce *entire* anæsthesia, that it is better *not to use* the gas after it has stood *over four days*. This, I feel convinced, from numerous trials, to be the more certain practice with this agent. I have never met a *single* instance in administering nitrous oxide gas, when fresh, to fail in producing *entire* anæsthesia, with from six to eight gallons of gas. Experiments will show that this quantity of gas will not always produce *entire* anæsthesia after four days' standing.

INHALING INSTRUMENTS.

In order to administer nitrous oxide gas successfully, it is indispensably necessary to use proper inhaling instruments, such only as are *perfectly air-tight*; and permit me to state, most emphatically, that it is absolutely imperative, in administering nitrous oxide, that it should be *unmixed* with atmospheric air. I cannot find an excuse, or comprehend how any one possessing *any practical* experience whatever in administering this gas, can advocate any practice or theory as that of allowing, and claiming it to be *better*, to admit a portion of atmospheric air with the gas while it is being inhaled, for it is *positively ruinous* to its anæsthetic properties.

There having been quite a variety of inhalers introduced, and recommended for use, I think it would be advisable to dwell a little upon the relative advantages some of them possess separately.

I purpose to confine my writing to three varieties: first, inhalers that cover the mouth and nose; secondly, the plain inhaler, with exhaling valves; thirdly, the plain inhaler, without exhaling valves.

I shall first confine my thoughts to the inhalers that cover the mouth and nose. I think there are great and serious objections to these, from the very simple, *though* important fact, that they do cover the mouth. Investigations and close observations in the administration of nitrous oxide gas, have firmly convinced my mind, that the lips constitute *one* of the *principal* guides to its anæsthetic, but *particularly* its *physiological* effects. I believe it to be almost impossible to understand what physiological changes are taking place when the lips are concealed from observation, inasmuch as the mucous membrane furnishing, as it were, a beautiful covering of transparent glass, enables us to see and know how the blood is being affected, and also serves as a beacon light to warn the operator from approaching danger.

Also, in administering with these inhalers, to gentlemen with bearded faces, it is a matter of great difficulty to make them air-tight. I have known, in several instances, in the effort to keep them in position, while administering to a restless patient, the face to have been badly bruised, owing to their being made of a hard and inflexible material. Of this class of inhalers, the one introduced by Dr. G. T. Barker is far preferable, from the fact that he has obviated the necessity of bruising, by having them made of soft and flexible rubber, besides rendering it much better in its adaptation to different faces.

The plain inhaler, with exhaling valves attached by tubing with the gasometer, is a very efficient mode of administering, when the inhaler is perfectly air-tight. It is necessary to exercise considerable care in administering with these inhalers, to observe that the valves are *perfectly* air-tight,

for they occasionally get out of working order, and the result is, the operator is subjected to the mortification of a failure to induce insensibility, as well as a great waste of gas, simply because atmospheric air is being inhaled with the gas by the imperfection of the exhaling valve. This I believe to be the principal reason why so many awkward failures happen to persons not entirely familiar with the use of nitrous oxide. I think we are in great need of improvement in inhalers, and a fine opportunity offers for some ingenious person, with the endowment of inventive genius, to produce one that will meet the requirements that are not found in those in use at the present time.

For uniform and universal practice and success, I must conscientiously give preference to the plain inhaler with the bag. I am well aware that many eminent practitioners and writers on this subject condemn, in strong language, the employment of this method for administering nitrous oxide.

Now, theoretical meditation would undoubtedly substantiate and fully endorse this theory, from the palpable demonstrative appeal it presents in its very appearance; but I think it deserving a little practical demonstration in the comparative sense, ere it should be so strongly condemned. It certainly does not greet the eye, or the careful mind, with as pleasing and agreeable an appearance as some other modes of administration: but, in common justice to its intrinsic worth, I must regard it as the most successful mode of administering for all practical purposes and intentions, in use at the *present time*.

I employ both methods of administering, and the result of my experiments have demonstrated to my mind that, to *always* meet with success, the bag with the plain inhaler is always reliable. I have found, repeatedly, when other methods have been employed unsuccessfully, that the bag can be depended upon with *entire certainty* in all the most difficult cases. It has happened in numerous cases to be my allotment to meet with a large number of patients who have breathed the gas unsuccessfully, from some difficulty not clearly understood by the operator. He has not, even after administering from twenty to thirty gallons of gas, been able to induce anæsthesia, and he very naturally informs the patient that he will be compelled to employ some other anæsthetic agent more potent, &c. This, I am sorry to say, is no uncommon occurrence, and I am positive, from repeated experiments with identical cases, that the difficulty was not in the constitution of the patient, but either in the improper manipulation, or by the valves in the inhaler allowing atmospheric air to get in and reduce the strength of the gas.

The bag should be thoroughly rinsed after each patient, to insure cleanliness; also, the patient should be instructed to exhale as much atmos-

pheric air as possible prior to applying the inhaler to the mouth. By observing this precaution, the gas is inhaled comparatively pure, excepting the residuary air of the lungs; and by allowing the gas to be exhaled through the nostrils, carbonization of the blood is, to a great extent, prevented. The palpable advantages demonstrated practically by this method, I must confess, have prejudiced me in favor of its employment in all difficult cases.

The mouth should invariably be propped open with some material that will not be liable to injure the teeth in the contraction of the muscles of the lower jaw.

The evidences characterizing its anæsthetic effect are the following: First, the blood corpuscles in the capillaries exhibit a changing color, showing some powerful physiological action is taking place, soon followed by heavy breathing—something like snoring—and in many cases a twitching of the general muscular system is also present. These presentations should, collectively, determine its anæsthetic effect. In very many cases the snoring is entirely absent, also the twitching of the muscles, consequently it will not answer to depend upon these evidences universally. But the darkened color of the blood, as demonstrated in the capillary system, should, in my opinion, constitute the most reliable evidence of anæsthesia.

CONTRA-INDICATIONS OF NITROUS OXIDE.

I believe nitrous oxide gas to be without doubt the safest anæsthetic in use at the present time. But it is doubtless not entirely exempt from danger, if employed by a novice, but in the hands of a skillful operator, who is thoroughly and practically conversant with its peculiarities and administration, I believe it to be comparatively harmless. Having practically demonstrated with about *eleven thousand persons* under its influence, and those persons having been administered to indiscriminately, as they presented themselves, and not in a single instance, so far as known, has any one sustained any ill effects from its inhalation; besides, many of them were known to have been suffering from chronic and organic diseases of different characters. These practical demonstrations constitute my convictions of its almost entire freedom from danger. But I am firmly convinced that unless the operator is *very familiar* with its administration, that in all cases of heart disease, phthisis pulmonalis, congestion of the brain or general plethoric diathesis, it would be advisable not to administer the gas; for I am satisfied that in quite a number of instances which I have met with, that it doubtless would have been attended with loss of life had not great caution been exercised in its administration.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY, }
 Northeast corner Tenth and Arch streets,
 March 1st, 1869. }

PROF. G. T. BARKER :

Dear Sir :—The undersigned, at a meeting of the Graduating Class of the Pennsylvania Dental College, H. D. Bennett, of Illinois, in the chair, and Samuel H. Linn, of Philadelphia, Pa., Secretary, were appointed a committee to request of you a copy of your Valedictory Address for publication.

Thinking that the dissemination of the same will be of advantage to the progress of Dental Science, we remain,

Yours, very respectfully,

J. WILSON MOORE,	} <i>Committee.</i>
D. VAN BUSKIRK,	
L. S. MURIDGE,	
T. J. MITCHELL,	
F. R. THOMAS.	

H. D. BENNETT, *Chairman.*

S. H. LINN, *Secretary.*

PHILADELPHIA, March 2, 1869.

GENTLEMEN :—Your kind note requesting a copy of my Valedictory Address for publication, was duly received. In reply would state that I cheerfully comply with the request, and tender to the class my thanks for this mark of their esteem. I would suggest the DENTAL TIMES as the medium for its publication.

I remain, very truly,

GEO. T. BARKER.

To Drs. J. Wilson Moore, Van Buskirk, Muridge, Mitchell and Thomas.

VALEDICTORY ADDRESS TO THE 13th GRADUATING CLASS OF
 THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

BY GEO. T. BARKER, D. D. S.

Professor of Dental Pathology and Therapeutics.

In consequence of indisposition on the part of my colleague, Prof. Wildman, who expected to perform this duty, I have been selected by the Faculty of this institution to address you this evening. The present occasion, with its varied exercises, must be to you of marked interest ; it represents the realization of hopes which have doubtless seemed long deferred ; it marks, with each one of you, an event which will influence your future lives, and cause this hour to be ever remembered. This honor which you have received, is a fitting testimonial to honorable labor ; it attests that

you have right worthily striven for, and have right worthily won, the degree which this Commonwealth, through the honored President of the Board of Trustees, has bestowed upon you. But not to you alone is the present occasion one of intense interest. I doubt not that there are here before me fond parents and admiring friends, who have witnessed to-night the ceremony of conferring degrees, and have seen with pride your reception of the coveted honor. How fitting, then, is the floral offering so plentifully bestowed, but the continuation of the ancient custom of crowning the victor with flowers as a reward for the meritorious, and an incentive to exertion. Beside yourselves and friends, the Faculty of this institution feel a deep interest in the present exercises. To them your success represents the fruit of their labor, and with one accord they warmly greet you in this new outset in your professional career. How well they have fulfilled their duty to you time can alone determine, and to that unerring touchstone we leave the decision.

In the selection of occupations or pursuits in life, there are generally some great impelling motives which cause us to make a certain choice. How many of you, I would ask, have selected the profession of a dentist because it was thought to be an occupation easily acquired—calling for less expenditure of labor than the professions of ministry, medicine or law, besides giving the one regularly educated and graduated a right to add the doctorate to his name, not forgetting that idea which pervades to some extent the public mind, that the pursuit of dentistry is very remunerative—a certain road to wealth and competency. This brief review of what might be called prominent impelling motives is not overdrawn. As an instance, a story is related of a Frenchman who had some operation performed by one of our eminent American dentists in Paris; on learning the amount charged, he was astounded, but, concealing his chagrin remarked, that if ever he had a son, that son should be an American dentist—a bull not unworthy an Irishman, but not a surprising error, when we find all over Europe persons claiming to be American dentists, who have never visited this country, and are unfamiliar with our teachings or our language.

I trust, however, that if any of you have entered upon the study of dentistry with such unworthy motives, that they have long ere this cast them aside, and have been supplanted by the more noble desire to minister to the ills of suffering humanity, to alleviate pain and discomfort, and contribute by laudable effort to the happiness of our fellow beings, and this brings me to the theme of my brief address, viz: "Our Mission."

I doubt not that almost every one who has looked at the announcement of branches taught in a Dental College has wondered how six gentlemen could lecture on six different legitimate subjects in a Dental College.

They will doubtless say that on the branch of Anatomy what does a dentist require except a knowledge of the anatomy of the head? What does *he* need to know about the intricate sciences of chemistry, physiology, pathology or *materia medica*; certainly he can make but an exceedingly limited use of these branches in practice. To all such I would remark, your thoughts are but natural, but they are nevertheless erroneous. As well attempt to study a language without becoming conversant with its alphabet or grammatical construction, as to study any specialty of medicine without a knowledge of its fundamental principles. You have received from your Professor of Anatomy such instruction as fits you to know the character of the tenement in which we live, breathe and reason. Knowing the organs and their functions, you are enabled to recognize their influence, when diseased, upon other structures, and to understand those trying maladies so frequently arising from sympathy, or what we term reflex nervous action. The same remark may justly apply to the other branches named, for it is only by a knowledge of these that we can apply the principles of our profession in its highest sense. There is a law of the human economy which is each year becoming more and more recognized by all practitioners of medicine and its specialties, that any derangement in one organ, or set of organs, being present, there is a corresponding derangement, more or less expressed, in every other organ in the whole body. When we recognize this law, we see how impossible it is for us to study one class of organs and diseases without studying the whole morbid actions of the economy. Recognizing this law, we must be as familiar with the nerves which proceed to the organs of digestion, as those which pass to the jaws and teeth.

This, then, is a part of our mission, to teach the people these unrecognized facts: for it cannot be denied that there are to-day thousands in every land who are suffering from indigestion, with its attendant train of consumption, dyspepsia, hysteria, neuralgia, epilepsy or insanity, the real first cause of which lay in the improper mastication of food, in consequence of defective teeth. Looking at our mission in this light, have we not, then, a holy occupation—one worthy of the highest mental culture and earnest effort—one, too, that ennobles its true votaries?

But this is not your only task; in your study of the phenomenon of disease, you have learned that previous to a departure from health there must exist a predisposition (in certain instances) to disease. This is invariably the case with the organs we are called upon to treat. We are daily asked—Why do teeth decay? What can we do to prevent the ravages of disease? Here our mission, as teachers and advisers, appropriately comes into play. We can urge the importance of cleanliness, which has been said to be akin to godliness; of the influence of diet, pure air, exercise and

ventilation ; of the value of bread materials containing earthy phosphates, which is necessary for the nutrition of the bones and teeth -- a kind of bread which is rarely seen on the tables of the well-to-do in this country, but which, in my judgment, accounts to a good degree for the more perfect development of the dental organs of the Germans and peasantry of Europe. In our country, the white, puffy bread which is so much sought after, is manufactured of grain so finely ground and bolted, that these important mineral phosphates are removed—large portions of nutritious elements being lost to consumers.

Here, too, must we study the influences of hereditary traits, the effect of malformation and defective nutrition, and, with knowledge, observation and experience going hand in hand, give relief from pain both by advice and treatment. For this mission you go out well prepared, both in brain and hand, from our college halls, for, by a reference to our programme your friends will see that your training, as good Samaritans has, ere this, commenced. The clinical report for the present session gives, as the total of operations performed, 6,707 ; as the number of persons who have partaken of its benefits, 2,758, for which no pecuniary reward was exacted. Does this not, then, while proving your devotion to the study of your specialty, also attest the value of this college as one of the benevolent and charitable institutions of our city ? And I would here remark, that from its establishment to the present time, over 24,000 persons have partaken of its benefits, and over 70,000 operations, of all kinds, have been performed. This, too, has been accomplished without a dollar of pecuniary aid from any one except our own Faculty. Dental colleges, then, as great eleemosynary institutions, deserve the support and encouragement of the public, as well as the profession. Who can estimate the value of these operations, or their influence on the health and happiness of the recipients ? Only *he* who can compute the value of a tear, the silent pressure of the hand, and the low murmured expressions of thankfulness ; and this, my now fellow-co-laborers, will be a portion of your heritage if you worthily perform your duty. Are you competent to perform this, your mission ? In the diploma we have signed, we have answered—yes ! for we have said we believe you competent to commence the practice of dentistry ; we expect that earnest study, untiring labor and enlightened experience, will enable you in the future to perform your entire mission, both as teachers and healers of the people. Like the practicing physician and surgeon, you are conservators of the public health. “ Health,” which it has so aptly been remarked “ is so necessary to all the duties, as well as the pleasures of life, that the crime of squandering it is equal to the folly ; and he that, for a short gratification brings weakness and disease upon himself, and for the pleasures of a few years passed in the turmoils of

diversion and clamors of merriment, condemns the maturer and more experienced years of his life to the chamber and the couch may be justly reproached—not only as a spendthrift of his own happiness, but as a robber of the public—as a wretch that has voluntarily disqualified himself for the business of his station, and refused that part which Providence assigns him in the general task of human nature. There are, perhaps, very few conditions more to be pitied than that of an active and elevated mind laboring under the weight of a distempered body. The time of such a man is always spent in forming schemes which a change of wind hinders him from executing; his powers fume away in projects and in hope, and the day of action never arrives. He lies down delighted with the thoughts of to-morrow; pleases his ambition with the fame he shall acquire, or his benevolence, with the good he shall confer. But in the night the skies are overcast, the temper of the air is changed; he wakes in languor, impatience and distraction, and has no longer any wish but for ease, nor any attention but to misery. It may be said that disease generally begins that equality which death completes; the distinctions which set one man so much above another are little perceived in the gloom of the sick chamber, where it will be vain to expect entertainment from the gay, or instruction from the wise. When all human glory is obliterated, the wit is clouded, the reasoner perplexed, and the hero subdued; where the highest and brightest of mortal beings finds nothing left him but the consciousness of innocence.”

If, then, this be a true picture of disease, what a privilege is ours that we may enlighten and instruct the innocent, who, by their habits, are laying the seeds of disease for themselves and their offspring.

Oh, how much every thinking practitioner of any specialty of medicine must see the want of *missionaries* to instruct the people upon the great laws of health; how many err through ignorance, and then, perhaps, with the fatalism of the Mahomedan, call disease a dispensation of Providence when it is but the result of disobedience to nature's laws, and that the sins, too, of the parent, and they may be either of omission or commission, are visited upon the children to the third and fourth generation. This, then, is one of the great wants of the people to know and recognize nature's laws. Almost within the sound of my voice are whole families living in rooms devoid of ventilation, making use of articles of diet either so badly prepared or deficient in nutriment as to predispose them to disease, and to cause the average mortality amongst their offspring to be simply frightful to contemplate. And not alone amongst the poor and ignorant are nature's laws neglected and outraged, for we are told by an eminent writer in one of our late serials, that one cause of the increase of consumption in our country is due to the fact that sunlight is excluded

from our houses. This is done that the children may not be freckled, the carpets faded, or curtains discolored. And yet both these classes named love their children, and their own safety, and would change their residence without loss of time did they think nitro-glycerine was stored in the neighborhood. But what is wanted is, to demonstrate to the people that all violations of natural laws have their corresponding penalties, that the law of *compensation* is more certain than the probabilities of the explosion of an invoice of nitro-glycerine. And this teaching of the people may be accomplished to a good extent by you, because the demand for dental service is so universal, bringing every class and condition within our influence, *all*, sooner or later, require some attention. In an experience of several years in this city, I have yet to see the *first* perfect set of teeth. I have seen a few who have gone from youth to old age with slight dental attention, but have never seen one who had not, at some time, desired such service.

But to attain to this high position, what are the prerequisites beside knowledge? I would answer, gentlemanly address and deportment, a strong physical organization, and a well-balanced mind. All occupations that are entirely literary, or purely mechanical, are exhaustive in their character.

Dr. Holmes, on this subject, remarks: "There is one great fountain from which all the living organism gets its sustenance and its stimulus—the heart, with its vivifying and kindling outflow. There are three principal fields to be irrigated and enriched, the lowlands of the digestive organs and their dependencies, the scattered domain of the muscular system, and the imperial realm of the great thinking centre, the brain. The supply of blood is limited, and if one part gets more than its share, another part must have less. It follows that the glutton is not likely to have muscular or intellectual activity, that the athlete is pretty sure to be temperate in his calls on digestion, and that the powerful thinker is not often a great feeder, or a man of excessive muscular development." These cases illustrate the doctrine that great development in one range of powers draws away the sustenance, more or less, from the rest. The well-known method of medical treatment, called *derivation* or *revulsion*, proceeds from the same principle. When a great writer used to put his feet in a hot bath after hard mental labor, it was to get back the blood to them of which they had been robbed by the brain. The principle holds true in the case of each day's efforts of each individual, as it does between one man and another. The brain is at its maximum of efficiency when the digestive powers are moderately taxed, and the muscles have not been recently exercised to any great extent. There must be a flood of the circulating current to supply the enormous quantity of gastric

juice required to digest a hearty meal. There must be a rush through all the channels that reach the muscles to supply them while at work, for they suck up the blood like so many sponges. All this must be at the expense of the brain, which, if it is to work hard, must have torrents of the vital fluid to turn its undershot and overshot wheels. The vocations of the thinker, the athlete and the feeder, must be, therefore, to a certain extent, specialties. Yet he who thinks, were he Plato, or Newton, or Humboldt, must eat and exercise. In fact, healthy persons alone are able to pass from a life of thought to that of muscular exercise or digestion without showing manifest incompetency for either. Another important point is this, what wears men out quickest is a strain on the will, the exercise of perpetual intellectual balancing, followed by new volitions. All habitual labor, not excessive, soon becomes to a great degree automatic, and involves a vastly less expenditure of the vital force of the system than when it is done by a sustained series of conscious efforts. The kind of labor, then, as well as its amount, must be considered in estimating the amount that can be done."

I have made this seeming digression for the purpose of showing that our specialty calls for a double demand on the great blood-stream; we perform exhaustive mental and physical labor at one and the same time. Each operation requires thought and study, beside hand labor, to accomplish it properly; therefore let me say to those who have entered its domain with an idea that it is an easy, pleasant, unlaborious pursuit, that they have mistaken their calling, and for those there is no room—the space allotted to such persons being filled to repletion. Like all new specialties, those who succeed are the laborers. He who would emigrate to a new country must himself develop the soil, cut his own timber, build his own cabin. So he who would achieve honor in dentistry, must toil with hand and brain, wresting from the domain of science her hidden secrets, making them available and useful to humanity. To such success ever comes; if not in the shape of large pecuniary rewards, in that more to be desired form—the inward consciousness of life well and nobly spent.

Members of the graduating class, I could not more fittingly close this address (in which I have briefly traced what appears to me an important part of your mission) than to adopt the eloquent language of Lord Brougham, on the occasion of his being installed Rector of the University of Glasgow: "Study," said he, "I beseech you, so to store your minds with the exquisite learning of former ages, that you may always possess within yourselves sources of rational and refined enjoyment, which will enable you to set at naught the grosser pleasures of sense, whereof other men are slaves; and so embue yourselves with the sound philosophy of later days, forming yourselves to the virtuous habits which are its legiti-

mate offspring, that you may walk unhurt through the trials which await you, and look down upon the ignorance and error that surround you, not with lofty and supercilious contempt, as the sages of old times, but with the vehement desire of enlightening those who wander in darkness, and who are by so much the more endeared to us by how much *they want* our assistance. To diffuse useful information, to relieve suffering humanity, to further intellectual refinement—sure forerunner of moral improvement—to hasten the coming of that bright day when the dawn of general knowledge shall chase away the lazy, lingering mists even from the base of the great social pyramid, is, indeed, a high calling, in which the most splendid talents and consummate virtue may well press onward, eager to bear a part.” With confidence, therefore, bidding you seek light from the great infinite source of truth and knowledge, I bid you, in the name of my colleagues and myself, God speed on your mission.

THE AIR-CHAMBER OR SUCTION CAVITY.

BY W. H. TRUEMAN, D. D. S.

Of the many improvements which have been suggested or introduced in the construction of artificial dentures, few, if any, have proved so practically valuable as the suction cavity or air-chamber.

The dentist of to-day can scarcely appreciate the importance of this simple idea, or realize the constant trouble, annoyance and vexation of spirit attending the old-fashioned and now almost obsolete spiral springs. How sorely was the patience of our fathers tried, and their ingenuity taxed to the utmost, in the effort to make these rude appliances efficient and comfortable. Although modified and arranged in every conceivable way, the experience of many, many long years could suggest, they were still unsatisfactory, and a constant source of trouble and discomfort to both dentist and patient.

The present suction cavity, so generally in use, and so reliable and perfect in its action, although so simple, and in principle only a modification of an idea frequently made use of for the same purpose in nature and art from time immemorial, was not the creature of a moment's thought, or the result of one man's unaided ingenuity. Like other great discoveries, which have proved a blessing to our race, it was the *reward* of patient, persevering, untiring industry.

The unsatisfactory nature of the appliances then in vogue to secure the upper plate in position, led many of our profession to search for some new method by which the difficulties they labored under might be obviated. And it is, indeed, astonishing they should have labored in vain so long, when we remember there were many plates in use long before the invention of the chamber, held up by the same principle; it is true, not so firm,

yet sufficiently so to be used effectively. These plates having no reservoir in which the sustaining power could, as it were, be stored, the moment a particle of air found its way under the plate the adhesion was destroyed and the case fell; with the addition of the chamber, a cavity is formed into which the air accidentally introduced under the plate during the movements of mastication or speech, finds its way, and the plate is sustained in position until this vacuum is filled, or, the patient feeling the case loosening, instinctively removes it by the action technically termed *sucking up*, and this instinctively re-establishing the vacuum, constitutes, perhaps, the most important part of "*getting used to it*."

The air-chamber was first introduced to the profession in a patent granted to Levi Gilbert, of New Haven, Conn., Feb. 15, 1848. It is described as a cavity sunk in the central part of the upper plate, and in its first conception was very rude. It was formed by simply dropping a little melted wax upon the model, or removing a little of the impression from the centre of the surface designed to be covered by the plate, making the cavity small, shallow, and with but poorly defined edges. This small chamber improving the suction very much, it was gradually enlarged and brought into the shape and size now generally in use, and more care taken to make the edges sharp and well-defined. These improvements added very much to its usefulness, but the advantage gained was not fully realized until the introduction of plaster as a material for taking impressions enabled the dentist to obtain a comparatively perfect fac-simile of the palatine arch, and secure an accurate fit for the plate, an indispensable *pre-requisite* to success. A cast from a wax impression, however carefully taken, is at best but an approximation to nature, and cannot be relied upon.

The Gilbert central cavity idea has been modified in many ways; sometimes two cavities have been used, one on each side of the palatine ridge; sometimes four, six or even a dozen small ones scattered all over the plate—the number being increased more for the purpose of evading the patent than for any real advantage they afforded.

The first real improvement upon Gilbert's idea was invented and *patented* by John A. Cleavland, of Charleston, S. C., June 25, 1850. In his idea, the plate was made double—a slight space being left between them, and an opening connecting with it cut through the inner or first plate. This made the cavity very much larger, and not only covered up the projection of the ordinary chamber, but also prevented the membranes of the mouth ever filling it up, as was sometimes the case with Gilbert's. This was a decided advance, but was not without its special troubles. The space between the two plates afforded a place for the lodgment of food and foreign matter, almost beyond the patient's reach, and could not be kept clean. In soldering the second plate it would sometimes vary and

could not be struck up without destroying all the advantage gained, and also made rather a clumsy operation. In its original form it was but little used.

The next idea, we have to notice, was protected by a *patent* granted to Lorenzo Simonds, of Boston, Mass., Sept. 12, 1854, and was known as the *spring* or *elastic* chamber. In this the chamber was cut out as in Cleavland's, and covered by a thin elastic plate, which was pressed outward by a spring placed inside. When the plate was adjusted in the mouth, the chamber was forcibly compressed by the finger or tongue, and the air expelled; on removing the pressure, the reaction of the spring enlarged the cavity, and thus produced a vacuum. Whether this was intended to dispense with "sucking up," or only to assist it, doth not appear. It either would not answer, or the peculiar advantages it offered were not fully appreciated by the profession, and it failed. A few years ago it was again revived, as a *new idea*—the metallic diaphragm being replaced by one of rubber, with no better success.

This was followed by what was known as the *valve chamber*. By whom invented, or the exact date, I have been unable to ascertain. In this a metallic valve, acting somewhat like the safety-valve of a steam-boiler, ground into its seat and held in place by a delicately adjusted spring, was placed about the centre of the chamber, so arranged that when the patient produced a vacuum in the mouth, it would open and allow the air to escape from the chamber and underneath the plate; as soon as the air was readmitted the spring immediately closed the valve and maintained the vacuum, *provided* no particle of food or other matter found its way to the valve-seat, or interfered with the spring and prevented its closing. In practice it very rarely closed tight, and although very pretty in theory, was found to be far too complicated for the purpose. The writer recollects one case made on this principle which answered very nicely *after the valve was soldered up*; it would not stick before.

Quite a number of methods have been proposed with but indifferent success, to prevent the membrane of the mouth filling up the chamber. In some, the chamber has been covered by a perforated or sieve-like plate; in others, several bars have been placed across; with either arrangement, the difficulty in cleaning the case is a far greater objection than the advantage derived. The difficulty can be obviated by so modifying the Cleavland chamber as to leave a recess all round easily accessible to the patient's brush..

These are believed to be the principal modifications of the air-chamber which have been from time to time presented, or *sold*, to the profession.. The improved Gilbert, and simplified Cleavland ideas, have alone stood the test of time. We know not what may be developed in the future, but at the present time these two, whether applied to partial or entire dentures, seem to answer the purpose perfectly.

THE THIRTEENTH ANNUAL COMMENCEMENT OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The commencement exercises of this College took place on Saturday evening, February 27th. The evening being very propitious, a large audience was present to witness the final ceremonies of this always interesting occasion. The exercises were enlivened by choice music from the Germania Orchestra.

Upon the conclusion of the opening prayer, by the Rev. Mr. Morton, the Degree of Doctor of Dental Surgery was conferred upon the following members of the class, by Henry C. Carey, President of the Board of Trustees.

GRADUATES, 1868-'69.

G. W. Adams.....	Extraction.
Wm. N. Baumgartner.....	Inflammation.
H. D. Bennett.....	Inflammation of Pulp.
A. L. Betancourt.....	Diseases of the Antrum or Maxillary Sinus.
Jacob E. Brecht.....	Indigestion.
B. Climenson.....	The Use of Baser Metals in Dentistry.
J. P. Crowell.....	Caries, Physiological and Hygienic View.
John W. Crymes.....	Inflammation.
J. H. Downes.....	Inflammation.
R. R. Freeman.....	History of Dentistry.
Henrietta Hirschfeld.....	Treatment of Children during 1st & 2d Dentition.
S. H. Linn.....	Anæsthesia.
Lorenzo J. Martin.....	Scorbutus.
Thomas J. Mitchell.....	Extraction of Teeth.
T. S. Muridge.....	Dental Caries.
J. W. Moore.....	Digestion.
A. E. Peyrellade.....	Dentition.
J. E. Register.....	Dentistry <i>vs.</i> Medicine.
W. H. Roop.....	Facial Neuralgia.
C. Rohland.....	The Physiological Action of Anæsthetics.
B. L. Taylor.....	Dental Etiquette.
S. B. Tizzard.....	Treatment and Filling of Pulp Cavities.
F. R. Thomas.....	Administration of Nitrous Oxide.
D. Van Buskirk.....	Morbid Secretion of Mouth,

GRADUATES WHO HAVE BEEN IN PRACTICE SINCE 1852.

Robert Russell.....	Tennessee.	G. A. Haines.....	Maine.
A. J. Young.....	New Hampshire.	H. Gerhart.....	Pennsylvania.

The following comprises the complete list of matriculants for the present session, in all, eighty (80) students :

MATRICULANTS—THIRTEENTH ANNUAL SESSION, 1868-'69.

MATRICULANTS.	RESIDENCE.	PRECEPTORS.
Dr. G. W. Adams.....	Pennsylvania.....	Dr. J. W. Scarborough.
Fernando De Agüero.....	Cuba.....	Dr. J. Truman.
Teofilo De Agüero.....	Cuba.....	Dr. G. T. Barker.
Alberto De Agüero.....	Cuba.....	Dr. F. Abbott.
J. Fred. Babcock.....	Maine.....	Dr. Wasgatt.
W. W. Barden, M. D.,.....	New York.....	Dr. H. Barden.
W. N. Baumgartner.....	Maryland.....	Dr. G. S. Fouke.
A. A. Beardslee.....	Pennsylvania.....	Dr. A. Jayne.
H. D. Bennett.....	Illinois.....	Dr. C. M. Wilkey.
F. Brunet.....	Cuba.....	
A. L. Betancourt.....	Cuba.....	Dr. G. Fraim.
G. A. Beyselance.....	France.....	Dr. G. T. Barker.
J. E. Brecht.....	Pennsylvania.....	Dr. Ramsey.

J. B. Carhart,	Pennsylvania,	Dr. Beardslee.
G. T. Carpenter,	Illinois,	Dr. B. M. Baker.
E. H. Chichister,	Pennsylvania,	
B. Climenson,	Pennsylvania,	Dr. W. R. White.
Jos. Cornman,	Pennsylvania,	Dr. G. S. Searight.
J. P. Crowell,	California,	Dr. Perkins.
J. W. Crymes,	South Carolina,	Dr. S. Beard.
H. De Crow,	Illinois,	Dr. W. De Crow.
F. L. De Gour,	Pennsylvania,	Dr. Bulkley, Jr.
M. D. L. Dodson,	Pennsylvania,	Dr. G. N. Boaman.
J. H. Downes,	Pennsylvania,	Dr. G. Luce.
C. E. Edwards,	Pennsylvania,	
R. R. Freeman,	Tennessee,	
H. Gerhart,	Pennsylvania,	
Thos. H. Gilpin,	Maryland,	Dr. T. Musgrove.
Jos. H. Graham,	Pennsylvania,	Dr. T. L. Buckingham.
J. R. Griffith,	Pennsylvania,	
M. L. Gross,	New Brunswick,	Dr. Hatherway.
G. A. Haines,	Maine,	Dr. Procter.
Wm. E. Hauley,	Ohio,	Dr. Macomber.
A. V. Hartlevan,	Pennsylvania,	Dr. J. Davis.
Marcellus Harvey,	Illinois,	Dr. P. M. Parker.
Jos. M. Hendricks,	Pennsylvania,	Dr. Winterbottom.
W. Hilliard,	New Jersey,	Dr. C. S. Stockton.
Henrietta Hirschfeld,	Prussia,	Dr. J. Truman.
L. G. Howard,	Cuba,	
Samuel H. Linn,	Delaware,	Dr. Massey.
M. L. Logan,	Pennsylvania,	Dr. Green.
Alfredo Martinez,	Cuba,	Dr. T. L. Buckingham.
Lorenzo J. Martin,	Cuba,	Dr. G. T. Barker.
J. H. Mease,	Pennsylvania,	Dr. S. H. Guilford.
C. W. Meloney,	Delaware,	Dr. Bonwill.
G. J. Miller,	Pennsylvania,	Dr. J. Heise.
T. J. Mitchell,	North Carolina,	Dr. M. E. Banner.
J. W. Moore,	Pennsylvania,	Dr. H. W. Moore.
J. M. Moore,	Pennsylvania,	Dr. G. T. Barker.
H. A. Moyer,	Indiana,	Dr. W. L. Andrew.
T. S. Muridge,	Washington Territory,	Dr. H. Plieece.
J. R. Hill,	Delaware,	Dr. E. W. Haines.
Edwarde Peyrellade,	Cuba,	Dr. Dunning.
W. G. Phelps,	Delaware,	Dr. Register.
Eurique Pieiro,	Cuba,	Dr. G. T. Barker.
E. M. Pierce,	Pennsylvania,	Dr. Danforth.
Jose M. Portuondo,	Cuba,	Dr. J. Truman.
G. L. Rauch,	Pennsylvania,	Dr. W. J. A. Birkey.
J. E. Register,	Maryland,	Dr. H. C. Register.
Manuel Roca,	Cuba,	Dr. A. Yzquierdo.
C. B. Rohland,	Pennsylvania,	Dr. S. H. Guilford.
W. H. Roop,	Pennsylvania,	Dr. E. M. Neal.
Robert Russell,	Tennessee,	Dr. Harris.
Rafael Salsbarria,	Cuba,	
R. S. Sanborn,	Maine,	Dr. E. T. Wasgatt.
Jos. Shiom,	Pennsylvania,	Dr. G. S. Searight.
C. J. Shower,	Pennsylvania,	Dr. G. S. Searight.
M. C. Sim,	Ohio,	Dr. R. Keyser.
B. L. Taylor,	Minnesota,	Dr. Bausman.
F. R. Thomas,	Pennsylvania,	Dr. A. J. P. Preterre.
Samuel B. Tizzard,	Ohio,	Dr. Macomber.
Chas. Tyson,	Pennsylvania,	Dr. J. Truman.
A. Urian,	Pennsylvania,	Dr. J. D. White.
D. Van Buskirk,	Pennsylvania,	Dr. J. Andrew.

John D. Ware,	.....New Jersey,	.....Dr. E. Chew.
J. R. Webb,	.....Mississippi,	.....Dr. S. K. Smith.
Wm. R. White,	.....Pennsylvania,	.....Dr. Wm. R. White.
G. E. Winters,	.....Maryland,	.....Dr. G. S. Fouke.
W. E. Wolfe,	.....Ohio,	.....Drs. Scott & Crider.
A. J. Young,	.....New Hampshire,	.....Dr. C. Lad.

The amount of operative and mechanical work performed, is detailed in the following reports of the Demonstrators. The figures indicate a large amount of practical work in these branches. A careful and unprejudiced examination of these two reports, must certainly carry conviction to the most prejudiced mind, of the immense advantages of college instruction over private pupillage, however well conducted it may be.

The infirmary of this institution is almost constantly thronged with patients, who are distributed to the students in accordance with their ability, all being obliged to operate as often as the facilities of the infirmary and rules require. This department is under the constant supervision of two competent Demonstrators, who give the entire time of each afternoon until four o'clock, in instructions in all the operations presented. It must be therefore apparent, that the opportunities thus afforded beginners to secure ample practice, and the confidence so essential at the commencement of office practice, are not to be over-estimated.

DEMONSTRATORS' REPORT, SESSION OF 1868-'69.

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic,	.....2663
Gold Fillings,	.....1124
Tin Fillings,	.....701
Amalgam Fillings,	.....85
Wood's Metal,	.....4
Hill's Stopping,	.....108
Oxy-Chloride Zinc,	.....62
Treatment of Pulp,	.....276
Superficial Caries Removed,	.....51
Treatment of Periostitis,	.....35
Do Alveolar Abscess,	.....49
Do Inflammation of Gums,	.....18
Do Partial Necrosis,	.....3
Removal of Salivary Calculi,	.....106
Extraction of Teeth and Roots,	.....2990

EDWIN T. DARBY, Demonstrator.

ELIHU R. PETTIT, Assistant Demonstrator.

MECHANICAL DEPARTMENT.

95 patients were supplied with the following artificial dentures:

Full Upper and Under Sets,	.....18
Full Upper Sets,	.....36
Partial Upper Sets,	.....36
Partial Under Sets,	.....2
Obturator for Cleft Palate,	.....2
Teeth Mounted on Silver Base,	.....614
Do do on Aluminum Base,	.....42
Do do on Adamantine Base,	.....112
Do do on Hard Rubber,	.....510
Whole number of Gum Teeth inserted,	.....1139
Do do of Plain Teeth inserted,	.....139
Number of Teeth Mounted for patients,	.....—1278

DEPOSITING SETS.

3 Full Upper Sets on Hard Rubber Base, No. of Teeth,	42
1 Partial Upper Set do do do	13
2 Full Under Sets do do do	28
1 Upper Set on Metal, with Hard Rubber, do	14
16 Full Upper Sets on Metal Base, do	224
1 Full Under Set do do	14
3 Partial Sets on do do	15
1 Upper Set on Porcelain Base, do	14
Number of Gum Teeth,	340
Number of Plain Teeth,	24
Number of Teeth on Depositing Cases,	364
Total number of Teeth Mounted during the Session,	1642

J. M. BARSTOW, Demonstrator.

R. R. FREEMAN, Assistant.

The closing charge to the graduates was delivered by Geo. T. Barker, D. D. S., Professor of Dental Pathology and Therapeutics, at the conclusion of which the distribution of floral offerings took place, the gifts of friends of the graduates. This attractive feature of the commencement is a fitting complement to all these exercises, affording a gratification to giver and receiver.

It will be observed that amongst the list of graduates occurs the name of a lady, Mrs. Henrietta Hirschfield. As this is an innovation on established usages, it seems proper to state that in every particular she performed all the duties required of a student, and was enabled to equal the other graduates in all departments, fully justifying the belief of some, that success in our profession is not and cannot be limited to sex. This lady returns to Berlin, Prussia, to practice her profession.

Notwithstanding the open and underhanded influences brought to bear to injure this college during the past year, it will be observed that it still retains its prominent position, which we believe it will continue to maintain as long as it is conducted, as at present, with a determination to advance the highest interests of the profession.

With the benediction closed these interesting exercises, and thus ended a session of more than usual interest, and, like those that have preceded it, one more step toward the eradication of ignorant practitioners from the profession.

REGULATING TEETH.

BY. C. A. MARVIN, D. D. S.

[Concluded.]

The last of the series of articles on this subject, long since due, was to be devoted to the consideration of the fourth general principle previously specified, viz:—*The orderly arrangement of the teeth, for the better prevention of decay.*

It is held to be a fact, that it is a normal condition of the system,

wherein the best, (because the most vigorous,) development of the teeth occurs. By this is meant, that condition in which all parts and organs of the human frame perform their appropriate functions with ease and regularity; each occupying its proper place, and living in a state of harmony with its neighbor.

Coming now from a general to a special application of this rule, we infer that the best, (because the healthiest,) condition of the mouth is that in which all the teeth occupy their proper positions respectively, perform their appropriate work regularly, each living in peace with its neighbor.

Stated thus, no one denies the rule. But, when dentists are called upon to make their examinations, very few mouths are found to be in this normal condition; and, when the question arises, what is to be done? at once a host of opinions spring up, and practitioners differ as widely as though they were pursuing rival or opposite professions.

That opinions will differ among intelligent men is to be expected; but, in a profession claiming to be founded upon scientific principles, that there should be so radical a difference, is *not* to be expected.

The end sought should be one; the means to be employed in order to reach that end, may be various.

In the proposition I am now discussing, the end is the better prevention of decay, and the means of attaining that end is the orderly arrangement of the teeth.

When from any cause the teeth have become irregular, imperfect occlusion is generally a visible result. Perhaps less than half of the teeth in the upper or lower jaw strike at all upon their antagonists when the mouth is closed. Now it is a principle of nature, as applicable to the dental organs as to any other part of the organism, that appropriate use tends to healthy development; of course the converse of this proposition is equally true, viz: that lack of use tends to enfeeblement. Hence, teeth that fail to antagonize when the mouth is closed, lose that exercise which develops their strength. This is one evil result.

A second is, that deprived of antagonism, they are inclined to elongate or protrude from their sockets. This exposes a delicate portion of the tooth, the cervical portion, to the action of those solvents which are created in the mouth by the decomposition of particles of food by an abnormal condition of the saliva, resulting from an unhealthy state of the stomach, or by the deposit of that most injurious substance commonly called soft tartar. The enamel at the necks of the teeth being thinner, and possessing less of the flinty character than that which is further down upon the crowns, is unable to resist the action of these agents of destruction, and decay soon becomes visible; whereas, if they remained fixed in

the position nature designed them to occupy, the cervices would be completely enveloped by a healthy gum, and the deleterious action just explained, would be prevented.

A third evil resulting from imperfect articulation, is an excess of service in those teeth which do antagonize. Too much duty is injurious, as truly as too little. This statement is proved by the fact known to all observing dentists, that when a tooth is built up and left "too full" so that it strikes first and bears more than its proper share of pressure, soreness is soon felt in that tooth, sometimes to such an extent, that luxation follows. When this difficulty is remedied by cutting down the filling, the pain ceases, and health is restored.

A fourth evil of irregularity is the extreme lateral pressure upon the teeth. Bicuspid and incisors are found bearing upon each other, so as inevitably to chafe and cause decay. The crowns of these teeth are found oftentimes touching each other at points where they are not able to bear the friction. Lateral pressure, if slight, and sustained in the right place, viz: at those points where the diameter of the tooth is greatest, and the enamel thickest, is of great use. If applied in the wrong place, and excessively, it is very injurious.

These reasons are quite sufficient, in my judgment, to show the propriety of resorting to artificial means for the purpose of correcting irregularity.

To these might be added the general one, that when the teeth are in regular order, there is less danger of inflamed condition of the gums, and less desire to pick at them with penknives, metal tooth-picks, or anything that will alleviate the crowded feeling, which is so often experienced by persons whose mouths are deformed by irregular teeth.

Much more might be written upon this fruitful topic, but this must suffice at the present.

DR. ZUR NEDDEN'S ANSWER TO DR. TRUMAN.

We find appended to the selections from American Dental Journals, in the "*Deutsche Vierteljahrsschrift*," for January, the following answer to my article in the October number of the "*TIMES*:"

"Professor Truman, in reproducing our remarks made in the July number of the *Vierteljahrsschrift*, follows it with a series of remarks, which we are not able to give here in full, as they, in many respects, do not bear a direct relation to that written by us; but we cannot let them pass without notice.

First, we regret that the highly respected writer seems to have misunderstood us. We did not intend to draw a comparison between German and American dentists, but of *dentistry* in Germany, *i. e.* that specialty

of medicine which treats the diseases of the teeth as it is built up by German investigations, by dentists and physicians, or that of all other countries—compared with American dentistry. According to Dr. Truman's expression, this is there considered as a special profession, and not a specialty in medicine. This has developed itself mostly by native contributions, based on the science of dentistry of the old world, noticing but little the new, excellent and thorough foreign works.

We entertained a grateful appreciation of the merits of the American Dental Colleges, in the development of the practical part of mechanical dentistry, but were obliged to say in regard to Dr. Watts' expressions, that the scientific part of dentistry has made but little progress in that country, while it occupies decidedly a higher stand-point in Germany. Nevertheless, we do not, nor never did hesitate to expose the great defects of the conditions of dentistry in Germany, and to discuss the remedy to produce a change. We refer to the first article of this number.

We repeat, that the conditions in Germany are not adapted for institutions like those in America. We need the aid of the government, that opportunities be afforded medical students, during their period of study, for a practical education, as it exists in dental colleges in that country. The profession there need to recognize *the truth, that dentistry is a science, a specialty of medicine, and that it requires the same scientific education to practice it, as any other specialty of medicine.* It is immaterial whether the peculiar views, propensities or conditions of this or any other nation render it proper, advisable or useful, no matter whether the apparently favorable results in the hitherto adopted course, may lead to the supposition that the greater cultivation of the scientific part of the profession is unnecessary and superfluous. Without a full consideration of this truth, the acquirements of American dentistry will remain one-sided, just as well will our scientific educated dentists remain one-sided, if they do not perfect themselves in the practical part.

This opinion we must maintain, as it is one not uttered at random, but based upon the *most thorough knowledge of the whole dental literature of America, including the transactions of their associations and conventions*, an amount of information scarcely possessed by any other man in Germany. This knowledge does not alone extend over that the last few years have contributed, but over the whole period of the development of our specialty in the United States. While on the one hand this literature was productive of but little for science, on the other, it rarely ever noticed the best German works. (It is desired that this should be understood as applying to dentistry, as did my article in the July number, and not, as Professor Truman seems to have understood, as applicable to the scientific works of Germans in general.)

Professor T. endeavors to excuse this, by asserting that the majority of American dentists will only read in the journals that which is practically useful. But does not this exactly admit what I have written and repeat in regard to American dentistry? Does it not follow, as a natural consequence, that American dentistry, as a science, will be superciliously treated, as long as the scientific side is not sufficiently cultivated in the dental colleges? We remarked in our July article, that they fail to have a *strict scientific basis*, (these are the words we used, and not, as incorrectly translated *scientific foundation*,) and at present have had nothing to cause us to change our opinion.

It is very good, that to the students of the colleges, lectures are delivered on anatomy, physiology, pathology, materia medica, &c.; but is it strictly scientific if one or the other teacher takes just so much out of general anatomy, physiology, &c., as he may think necessary to give to his pupils, of special dental anatomy, dental physiology, &c., and they admitted regardless of their general education? Are not many writers discussing in the American journals the deficiencies pointed out by us, and coinciding nearly with our opinion? More than this, are not complaints constantly made in the American periodicals, that the medical will not consider the dental profession as their equals? What can be the reason for this, but that dentistry has separated itself from medicine, and that the majority of American dentists make a business, instead of having a dental practice, just as it was formerly here with surgery, as long as it was separated from medicine? Again, is it not stated in America that the constitutional conditions have a direct influence in improving the dental system, and that, in diseases of the teeth in general, an internal treatment should be used? Does not this require a better medical education than any dentist receives who is only educated in a dental college? Have not the gentlemen of the Indiana Dental Association admitted this indirectly, when, at their convention on June 26th, 1866, they discussed the question whether a dentist ought to be allowed to prescribe a tonic for constitutional treatment, or not?

As much as we should like to be in full harmony with our transatlantic brethren to work together for the improvement of our specialty, and as much as we regret to differ from the opinion of the, by us highly respected, Prof. Truman, on the above mentioned points, just as decidedly must we adhere to our opinion, which, for America, is also the correct one.

Dentistry is a science, is a specialty of medicine here as there; a sufficient scientific education is needed to its practice here as there, a sufficient knowledge of the science of medicine in general, as well as thorough skillfulness in the mechanical department. One without the other disposes to one-sidedness and incompleteness."

REMARKS.

In reproducing the answer of Dr. Zur Nedden, I in no wise wish it understood that I desire to extend the controversy—if such it may be called—but that he and those who think with him, may be fairly placed before our readers.

While I agree with him in the general spirit of his remarks, I still think that his criticisms of American dentistry, as represented by the colleges, is entirely too sweeping in character.

I am well aware that in stating that dentistry in America was considered a distinct profession, and not a specialty of medicine, that I differed from some occupying prominent positions, who think otherwise. Except in one or two isolated cases, there has been no attempt on the part of the medical profession to recognize the dental as a specialty. At the same time the assertion of our transatlantic colleague is fully endorsed—"that it requires the same scientific education to practice it as any other specialty of medicine," and we believe this is recognized as a truth by all the leading minds in it.

I stated in the October article that the teachings in our Dental Colleges had a scientific foundation, and Dr. Zur Nedden will pardon the error of translation in not giving him the benefit of the word "strict"—making his expression "*strict scientific basis*." While this modifies to some extent the objectionable features of the assertion, he still repeats, and undoubtedly believes, that our colleges do not teach dentistry in a scientific manner. While I am fully aware of his extensive knowledge of English and American work on this subject, and entertain great respect for his labors in giving this to German readers, I still believe that he is laboring under very great error in regard to the modes of teaching adopted. This is not surprising, when we know that but very few in this country, except they have been thus educated, have any clear idea of the work performed. In this connection I do not propose to speak for or of schools of dentistry in general, but shall confine myself principally to the one I have the honor to be connected with. It is certainly not true of that school "that one or the other teacher takes just so much out of general anatomy, physiology, &c, as he may think necessary to give to his pupils, of special dental anatomy, &c." It has been the aim, and I believe has been strictly carried out, to teach *every branch as thoroughly and completely* as possible. *No special efforts are made to select out such portions as bear more directly upon dental practice.* The incumbents of the chairs of anatomy, physiology, chemistry and pathology, would treat with proper contempt any suggestion looking toward the limitation of their teachings in any respect. The two gentlemen filling the two first named positions, have earned reputations in medical circles too extended to permit any one to suppose, for an instant, that they would adopt any such course. The first named, by

years of study in this country and Europe, followed by constant practice in lecturing on anatomy and surgery to a large class of medical students, certainly can claim to know how to teach scientifically. The ability of the Professor of Physiology, as an author and lecturer, is acknowledged all over the country.

Occupying *four professorships*, in as many different schools, at the present time, one of these in the University of Pennsylvania, and having filled other important positions, he certainly may be supposed to be equal to the task of giving his subject from a "strictly scientific basis." These facts are stated, not from any desire to arrogate to our school undue importance, but to contradict the idea honestly, but erroneously entertained, that dental schools are not scientifically conducted.

In those departments peculiar to Dental Colleges, I think the teachings are as thorough as possible, dealing with principles as well as results—commencing, as in operative dentistry and dental histology, with the lowest evidence of animal life, and tracing the progressive stages in development up to man. In a word, making comparative anatomy the basis of instruction. Can this be considered, in any sense, a selection for merely practical uses?

The view expressed by our respected colleague, I frankly admit, would have been correct years ago. It was, at an early period, supposed that only a certain portion of medical science was necessary for the dental student; but that false view, I am happy to say, has become one of the ideas of the past, at least so far as the Pennsylvania College of Dental Surgery is concerned. That much more is needed to render the teachings perfect, I frankly admit, and am quite willing to acknowledge that the greatest defect in both medical and dental instruction in this country is, a lack of a *standard of qualification previous to entering upon either study*. It is useless, however, to expect this while the colleges are sustained as at present. The change will come gradually, by the elevation of the standard of general education. As this is more and more improved, we shall look for progressively greater results.

There are some other points that I should like to notice at length, but I have written enough on this subject, and shall probably not recur to it again. My object has been attained if I have succeeded in establishing a better acquaintance on both sides of the Atlantic with the existing conditions in both. While I do not regard Dental Colleges especially deficient in science, I am of the opinion that dentists in general would be greatly benefited, and infinitely more respected, were they to enlarge their boundaries of knowledge. For this class, entirely too large, the criticism of our German cotemporary is peculiarly fitting, and I hope they may ponder it well, and act accordingly.

J. T.

THE USE OF BASE METALS IN DENTISTRY.

BY BENJAMIN CLIMENSON, D. D. S.

I propose to take up and consider the use of the base metals, as now for sale at the dental depots, in comparison with other materials in use at the present time as a base most suitable for the lower maxillary ridge. The rubber lacks specific gravity, and is easily thrown from the ridge by the motions of the tongue or muscles of the mouth, and is very liable to break in the centre, where it has often to be cut away to allow the free use of the tongue. Gold and silver are not so thick at the edges, and are very apt to cut the mouth.

In this connection, I desire to give my views of some of the advantages of the base metals, of which I have used Cheoplastic or Blandie's metal, Brown's metal, and adamantine. In these metals we have the advantage of weight, which gives stability and firmness in the mouth. The edges are thick and less liable to cut than gold or silver, and less liable to break than rubber. In making a choice of the three different metals named, I give the preference to adamantine, as it is the smoothest; and, in casting it, is less liable to bubble up, and be defective in the plate.

My experience with these metals is, that they do resist the action of acids in the mouth quite equal to, if not better, than silver. I have inserted lower plates of the base metals in the same mouth with gold for the upper plate, and have found them to give as much satisfaction to the person wearing the one as the other.

But enough for the comparison between the various metals used in mounting artificial teeth.

In regard to the composition of these metals, I will not attempt a description, as there is a disposition on the part of men generally to keep to themselves what they deem to be a secret, from which they expect to derive personal advantage. Therefore, I do not feel obliged to attempt to describe them. But I will, according to the best of my ability, give my views of the plan of manipulation to be pursued in getting up a plate, and mounting a set of teeth for the mouth, for the purpose of mastication.

First, take the impression in the usual way, then make the model of good plaster; when this is well dried and fit for use, form on the model a plate of wax, about the size and thickness you wish the plate to be when finished, or, at least, a very little thicker. Then form a rim of wax on the plate about, or as nearly as possible, the length of the teeth. Next, try the plate and rim in the mouth, and form the rim to suit. Be careful to get the patient to close the mouth properly, and when you get the proper "bite," as it is commonly called, oil the wax plate, rim and model. Next, prepare some good plaster and pour it upon the wax and model, thus form-

ing the antagonizing model. The proper step now to be taken is to select the teeth in the usual way to suit the mouth in size and shape, and grind and fit them on the wax plate to suit the articulation. Then be careful to place wax around the rivets, covering well the heads with the same material. I think it best to form the wax a little thicker, all the way round, over the heads of the rivets, as this will prevent any defects in the plate, and will allow some to come off at the point where it is most likely to be defective. When this is done you will proceed to form your molding model. Some use flasks somewhat similar to those used in vulcanizing the rubber work, with this exception : those used for moulding the base metals have what is called "a gateway" for the purpose of pouring into the model the heated metal. Those flasks have other small holes in the sides for the purpose of drying the plaster inside. I do not, however, use such flasks, but adopt a more simple plan of operation. When I have the teeth properly arranged on the plate and model, I place it on a table or level surface, and cover the exposed parts of the cast with sandarach varnish, and, when dry, oil the wax plate and model. I then place around it a strip of oil cloth, about twelve inches long and two and a half inches wide, fasten it with a piece of twine or light wire to keep it in position, letting the upper edge project over the points of the teeth. Then let plaster enough be prepared to fill the cup formed by the oil cloth and pour in until the teeth are well covered or imbedded in the plaster. When this is hard, the rim should be removed, and the model placed in or on a stove, and, as the wax begins to get a little soft, remove it from the fire and trim off the lower edges of the plaster ; slightly tap and separate the models and remove the wax, taking care not to disturb the teeth. Then, with a knife, cut a "gateway" for the pouring in of the metal, which "gateway" should commence at the back part of the model, between the alveolar ridges, and run forward to the front incisors. It should be sufficiently wide at the back part to make it convenient to pour the metal into it, but smaller where it comes in contact with the teeth. The next thing to be done is to cut small openings in the same model, at and on the top of the back part of the alveolar ridge, for the air to escape. The "gateway" should be cut in the upper part of the model, or that part which contains the teeth. The next thing to be done is to place the two models together firmly, and take some plaster, mixed with water, in the same manner as you would to make a cast, and unite the two pieces by spreading the plaster over the joint tolerably thick, so that it will not separate until you wish it apart. After thus screwing them tightly, place the model in the oven of a stove, in some drying position. I prefer to leave it in such position all night, as then it will be well dried, which ought always to be the case before pouring in the metal. Now, place the metal

in a small ladle, made of sheet-iron, or anything that will not melt, and hold it over a spirit lamp, and when well melted, while the model is well heated, pour the metal into the "gateway." Tap it lightly with a small hammer, and when you see the metal come out at the small air-holes at the back part of the alveolar ridge, you may assume that the metal has passed all around the teeth or ridge. When cool, tap with a hammer the plaster last put on, and it will crack off; remove it carefully from the teeth, and then, with a pair of cutting forceps, remove the rough parts, or projecting points. A rough file is now to be used, to be followed by a still finer one, until most of the roughness is removed from the plate, taking care all the while not to let the files come in contact with the teeth. An accident of this kind might produce an injury that could not be repaired. After you have done all you can with files, use scrapers, as you would in the rubber plate, and then use emery paper—first the coarse and then the fine—until all the scratches from the files or scrapers are removed. You have only then to apply the brush-wheel, and thus complete the polish.

Editorial.

OUR JOURNAL.

It will be observed that this number closes the present volume. We would earnestly repeat the request made to our subscribers in the January number, to renew their subscriptions prior to the issuing of the first number of Vol. VII, in July. This request is made for our convenience and their advantage.

We shall close this volume and begin the new with the positive feeling that the past year of labor has witnessed some advance in our profession, and in the intellectual status of its members. The marked improvements and the additions made to the list of dental journals, abundantly prove this. The influence these have in moulding their readers, few may know and still fewer appreciate. While it is very important to have good journals, it is equally as important to have interested readers in large numbers, and we trust the "TIMES" may receive its full proportion of these.

☞ We are under many and repeated obligations to Dr. F. R. Thomas for numerous specimens of irregularly developed teeth. Our friends have aided us materially by their many favors in this direction, and we hope they will still continue to feel the importance their contributions are to dental education. Many specimens of no real value to the owner, could be made a source of instruction to a large number, if deposited in our museum.

DENTAL LEGISLATION.

The Bill presented to the Legislature by the State Association, to regulate the practice of dentistry, has been defeated for this session. We do not regret it, as we considered and so expressed, that it was crude in form and perhaps open to many objections. In admitting this, we are not of that class who regard all legislative action inexpedient, if not absolutely wrong.

While it is undoubtedly true that any law would be productive of hardship in many cases, it must be apparent that some means should be adopted to rid the profession of quackery, or at least prevent any further additions to it.

Since the introduction of rubber as a base for teeth, the number of so-called dentists, that have been added to the list, may be counted by the thousands. It is within the cognizance of every practitioner, that this large number is mainly composed of men who have left mechanical pursuits, spent a few weeks in manipulating rubber, and then started out as full-fledged "dental surgeons." Is this state of things to continue? Are we to sit idly by and see the public victimized by such gross imposition, and put forth no effort to prevent it? Are the labors of the best men in the profession, to raise it from the mire of the past, to end in nothing? Are we, for the sake of these charlatans, to be for ever subject to the sneers of the more cultivated of the older professions? If so, then away with dentistry as a profession.

While the majority admit the necessity for action, many appear to think any law regulating practice will be inoperative. We do not agree with this view. If one cannot be passed requiring all those now in practice to pass an examination, let us have one prospective in its action. We can certainly prevent any more additions being made. We, however, believe that it should be made applicable to those now in the profession. If an examination unsettles the dignity of *twenty-five years of practice*, make the certificate depend on the number of years of actual practice, but at all events let us have some standard to lay the foundation. If, as is asserted by some, this law will have no positive force, but will be a dead letter on the statute book, it certainly will have the negative effect of preventing any further augmentation of the evil. We are not yet willing to believe, that should a law be enacted, that there are not enough fearless men ready and willing to see it *thoroughly enforced*.

Why is it that medical and dental practitioners in Europe are so very much in advance over the same professions in this country? Simply, because the laws are extremely severe there, and *entirely* exclude an improperly educated person from the ranks. Until this is done here, we fear the effort to elevate dentistry, with such a fearful train of ignorance, will end in gravitating the whole body into deserved contempt.

PROF. H. ALLEN'S VALEDICTORY.

This somewhat remarkable address, delivered before the graduating class of the Philadelphia Dental College, on the evening of the 26th of March, deserves, we think, a place amongst the *original* closing charges, if there be any such to be found.

We were not present at its delivery, and derive our information from the columns of one of our dailies, *The Morning Post*. We suppose it is correct, as it is evidently printed by authority.

No fault could possibly be found with it, were it delivered as an essay before an association of dentists; but, for one of the faculty to inform the students "that the medical profession will view your claims to fraternity with indifference, until you can base them on just ideas of kinship," must have been, to say the least, startling to the individuals. In plain English, it seems to us to mean—gentlemen, while you have studied anatomy, physiology, chemistry, &c. &c., for the same period required by the medical schools, you are nevertheless entirely unfitted to associate with graduates of those schools. Further along we find them informed, that "with the education now possessed, and the opportunities now afforded, you may rely upon it, that your reputation for learning and varied professional accomplishments established, you will be *sought for*, rather than continue *seeking* position."

The sarcasm in this paragraph must have been keenly relished by the medical part of his audience, but we can very well imagine not so much by the Doctors of Dental Surgery present. We have, however, no fault to find with it. It accords fully with our own view of the position, always having entertained the idea that individuals would receive respect and recognition when they could prove that they deserved it. What is true of the individual is true of professions, associations and governments.

We have never been of those who *sought* recognition from medical men in the sense mentioned. We believe our profession quite respectable, and sufficiently old enough to occupy an independent position, without begging support from any. We have felt that many connected with us were belittling themselves and their co-workers, by claiming to be a specialty of a profession that has never recognized them as such in any sense. If it is proper to invite one's self into another man's house, and claim to be one of his family, then such a course is right, not otherwise.

As this valedictory comes from a representative mind in the medical ranks, it may be considered as embodying the views of that body of men, and embracing the terms upon which graduates of Dental Colleges will be received, if ever a recognition of them as specialists in medicine takes place.

If, however, our advice be worth anything, it would be to cultivate medical science to its fullest extent, for its own sake, and not with the

remotest expectation of ever being recognized as worthy of kinship. Those who work faithfully through the labyrinths of scientific knowledge toward perfection, will most assuredly in time command respect, and force a recognition from would-be superiors. On the other hand, those who are content to remain at the starting point, will deservedly receive contempt.

We should be glad if this valedictory could have a wide circulation, for it is certainly time that some self-respect was instilled into the minds of a few who are constantly degrading their profession by aiming to be what they are not, and probably never will be, until conditions are changed.

VOTE OF THANKS.

At the close of the last meeting of Dr. E. R. Pettit's Quiz. Class, held in the Pennsylvania College of Dental Surgery, on motion of Dr. J. P. Crowell, a meeting was organized for the purpose of returning our thanks to Dr. Pettit for his services as an examiner during the term. Dr. J. H. Downes was called to the chair, and empowered to appoint a committee of five to draft a resolution to that effect. The committee presented the following preamble and resolution, which were adopted:

Whereas, Dr. E. R. Pettit, by his untiring devotion as a teacher and assistant to his class, has rendered us valuable service in the pursuit of knowledge; therefore, be it

Resolved, That we, as a class, unanimously return our most sincere thanks to him, for his services during the present term.

S. B. TIZZARD, *Sec'y.*

{ J. H. DOWNES, *Chairman.*
 { J. E. REGISTER,
 { R. R. FREEMAN,
 { J. P. CROWELL.

ERRATUM.

On page 114, line 20, of the January number, Vol. VI, for "altreaus" read "albicans."

Book Notices.

A Conspectus of the Medical Sciences—Comprising Manuals of Anatomy, Physiology, Chemistry, Materia Medica, Practice of Medicine, Surgery and Obstetrics, for the use of Students. By HENRY HARTSHORNE, A. M., M. D., Professor of Hygiene in the University of Pennsylvania, Auxiliary Faculty of Medicine. Professor of Organic Science and Philosophy in Haverford College, &c., &c. Henry C. Lea, 1869.

We have received from the author a copy of the above "conspectus." It is composed, as the title page indicates, of a series of "manuals for

use in connection with lectures." The author says, "it is the aim of this 'conspectus' to give in as brief a form, and as clear a manner as possible, the indispensable elements of a course of medical study, as taught in the colleges and conveyed in approved text books. Upon this plan, not only is originality not sought for, but individuality of opinion is intentionally excluded; and no merit but that of careful compilation and condensation is claimed for the work." He regards his position as that of an editor, rather than of an author, as "but three of the manuals have been prepared by his hand: those of *Anatomy*, *Physiology* and *Practice of Medicine*. The others were entrusted to gentlemen whose special studies gave reason for confidence in their execution of the task in each case to the best advantage of the student."

We have given this work a careful examination, and can unhesitatingly recommend it as the best of its kind that we are familiar with. As the title page indicates, it is intended for students as an aid, and to be used in connection with the lectures; but we think that those further advanced will find this valuable as a book of reference on many occasions. There are well-founded objections, felt and expressed, against the use, by students, of such books as tending to superficiality, and were study limited to such works, it would be a question whether they were not productive of more harm than good. We do not presume this is ever the fact, while as aids in study, they are certainly invaluable. With this view of the subject, we can conscientiously urge, not only dental students in colleges to procure this compilation of ably written manuals, but would also urge many of the "dental surgeons," who are unwilling to spend time or money in accumulating and reading more extended treatises, to procure this condensed form of the medical sciences and give it careful examination.

Quarterly Summary of the Transactions of the College of Physicians of Philadelphia, from December 5th, 1866, to December 2d, 1868, inclusive.

We acknowledge the receipt of this number of the "Transactions." It contains a number of interesting papers, among which we find two valuable statistical reports, by Dr. W. LEHMAN WELLS, on Meteorology and Epidemics. Memoirs are added of Theophilus E. Beesley, M. D., C. W. Pennock, M. D., and Francis West, M. D.

A SCIENTIFIC DISCOVERY is reported from Turin, where Professor Casturani, the celebrated oculist, has found a way of killing animals by forcing air into their eyes a few seconds, and almost without causing them pain. Experiments were recently made at the Royal Veterinary School, and it is said that they have fully proved the truth of the professor's invention. Within the space of a few minutes four rabbits, three dogs and a goat were killed in this manner. The most remarkable fact is that the operation leaves absolutely no outward trace.

Selections.

PLEASANT THOUGHTS FOR TOBACCO USERS.

Dr. W. H. Wetherbee, in an article on the Chemistry of Tobacco, in the *Journal of Applied Chemistry*, imparts the following agreeable information to those who delight in the Indian weed.

Among the various adulterations to which chewing tobacco is subject, are lead, copper, antimony, copperas, black hellebore, alum, sugar or molasses, dock leaves, and corrosive sublimate. These are added to give flavor or pungency to the weaker and poorer varieties, and the legitimate effects of such villainous compounds need not be mentioned. Too much of the "fine-cut chewing tobacco" is wrapped in an inferior kind of tin-foil, having a great proportion of lead in its composition, and partial paralysis of the tongue and muscles of the mouth has followed its use, from the lead salts thus formed, when the simple use of tobacco in its pure state would have failed to produce results so deleterious.

For chewing purposes, an article called British herb tobacco has been substituted for the genuine "weed," and is composed of thyme, marjoram, and hyssop, of each two ounces; coltsfoot, three ounces; betony and eyebright, of each four ounces; rosemary and lavender, of each eight ounces; the whole mixed, pressed together and cut in the form of plug-tobacco. It is harmless, cheap, and, among the poorer classes, answers a good purpose. For smoking purposes, the bark of the cascarilla is sometimes added to impart a peculiar flavor, and the leaves of various other plants are sometimes substituted in part for those of tobacco. Nitre is sometimes added to make it burn more rapidly, though it is frequently found in small quantities as a product of the chemical process of curing the plant. Potash, as before observed, exists already formed as one of the component parts of tobacco, aside from the trace of the nitrate which it contains, and in the usual process of preparation, a weak solution of potash, or its carbonate, is also sprinkled upon the leaves, and it is not unlikely, that while being dried, they may absorb a portion of nitrogen and oxygen from the atmosphere, sufficient to form a small amount of the nitrate.

Snuff-taking, though at one time almost a universal practice, has now fallen greatly into disuse, though in some of the Southern and Western States, and among the Spanish dames of the West Indies, the disgusting habit of *chewing snuff*, or, as it is called, *dipping*, is still followed to a great extent. Medicinally, it is recommended for colds, catarrh in the head, and several other purposes. Snuff is usually adulterated with salt, for the purpose of increasing its weight and keeping it moist, and with urine, muriate of ammonia, and powdered glass, to increase its acrimony and pungency. Some kinds are moistened with cane-juice, or molasses and water, which give rise to the vinous fermentation, and rum is sometimes added to produce the same flavor. Quick-lime or caustic alkali is sometimes added to the tobacco to develop the flavor, as well as to neutralize the acid formed in fermentation.

Many other substances are also added, either to color or flavor, thus forming the different varieties of Scotch, Welsh, Spanish, Lundyfoot, French, Russian, Strasburgh, Maccaboy, and many others. They are

sometimes medicated with subsulphate of mercury, nitrate of silver, etc., for catarrh, headache, inflammation of the eyes, and other diseases of the nerves of the head, the mucous membrane of the nose, etc.

HYPODERMIC INJECTIONS.

In the *Wiener Medicinische Wochenschrift* for March 28th, 1868, there is the conclusion of a series of articles by Dr. Adolf Hermann, of Pesth. In this he mentions as one of the accidents which sometimes follow the use of hypodermic injections, an œdematous swelling, which he thinks is caused by injury done to the lymphatics. He has noticed it only when the operation was performed on the cheek, and then only when the puncture was made too near the lip or the eyelids, places which he thinks should never be used for subcutaneous injections.

The whole half of the face swells up almost immediately, the eyes are closed, and one-half the lips so much swollen that the articulation is a little obstructed. In two to four days, without any treatment other than the application of some spermaceti ointment spread upon linen, for the purpose of excluding the air, the œdema, in the cases which came under his observation, always passed away without any further disagreeable consequences.

Dr. Hermann thinks that, except for the use of morphia, the danger of inflammation and suppuration more than counterbalances any advantage to be derived from hypodermic injections. In hotter climates than his own, however, he admits that the employment of quinia in this way, for pernicious fevers, may be advisable.—*Med. and Sur. Rep.*

WOLF-TEETH IN HORSES.

We notice occasionally in agricultural papers, and find not infrequent mention in our correspondence, something about wolf-teeth as affecting the sight of horses. This is an ancient prejudice, and entirely without foundation in fact. The name of wolf-teeth is given to small supernumerary teeth, which occur occasionally in the mouths of horses, and are situated commonly in the upper jaw, but sometimes in the lower, just in front of the first grinding tooth. They are most usually noticed in the mouths of colts, and, when the permanent teeth come, are almost invariably crowded out, and thus shed are not renewed. Sometimes the root of one of the milk-teeth is not absorbed properly, but crowded inward, where it remains, and is called also a wolf-tooth. This may cause the horse considerable inconvenience. A third application of the name is to points or edges of teeth not ground off by the action of the teeth upon each other in chewing and biting, when these points become so long or sharp as to cut the tongue or lips. It is an absurd prejudice (for which, however, the ancients are responsible) that attributes diseases of the eye to the supernumerary teeth above mentioned. There is not the least foundation for such a view. The wolf-teeth may remain, or they may be taken out without fear of any evil influence upon the sight of the animal. If not shed, they may be a nuisance, and are always a deformity, and may very properly be removed. This is easily done by an oak pin of convenient shape placed against the tooth and struck a smart blow with a mallet. The sharp angles or edges caused by unequal grinding are best filed away.—*American Agriculturist.*

RESEARCHES ON THE TOOTH-PULP.

An article on this subject by M. Franz Boll, a medical student of Bonn, one of Prof. Max Schultze's pupils, is published in the *Quarterly Journal of Microscopical Science*. The points to which he has directed his attention, are, first, the mode of termination of the nerves of a tooth, which is a subject as yet but little investigated; and, secondly, the relation of the intertubular dentine substance of the tooth to the tooth-pulp, and the development of the former from the latter. He has found the long incisors of rodents admirably adapted to this investigation, and in examining the nerves, has made use of the terchloride of gold, which was lately recommended by Cohnheim, and used by him in the investigation of the nerves of the cornea. With regard to the first of these matters in question, he states that extremely fine nerve filaments pass between the pulp-cells, and penetrate the dentine of the tooth, just as do the processes from the peripheral cells of the pulp; hence it is necessary to distinguish two sorts of dentinal canals—those which contain processes from the pulp-cells, and those which contain nerve-fibres. Three views as to the origin of the intertubular substance of the dentine have been current; one is Kölliker's, who conceives it to proceed from the calcification of a soft matrix excreted from the dentinal cells and their thin prolongations; the second is Waldmeyer's, who modifies Kölliker's views considerably, and denies the existence of a præformative membrane to the pulp. He maintains that the formation of the dentine consists in the conversion of a part of the protoplasm of the dentinal cells into a collagenous substance, which is subsequently calcified, while the remaining part of the cell protoplasm continues in the form of soft fibres to occupy the interior of the tube surrounded by the calcified substance. H. Hertz, in a paper published in *Virchow's Archiv*, 1866, states that the intertubular substance of the dentine is the chemically changed and calcified intercellular substance of the pulp-cells. Herr Boll proceeds to discuss the views of Waldmeyer and Hertz, but fact after fact has convinced him that Waldmeyer is correct. He gives several figures of the peripheral cells of the tooth-pulp—the odontoblasts—with from one to four processes projecting into the dentine substance. One of his sections shows the cells completely detached from contact with the dentine, excepting through their long fine processes; and it is most clearly seen that there is no connection between the hard substance of the dentine and any intercellular matter of the pulp: in fact, no such intercellular matter exists at the periphery. The limitation of the hard substance of the dentine, where it comes in contact with the cells of the pulp, is termed *membrana eboris*. The multiplicity of processes from the odontoblasts, instead of a single fibril, as originally described by Lent, is an interesting observation.—*Med. and Sur. Rep.*

SULPHATE OF NICKEL IN NEURALGIA.

Palmer, in *The Medical Record*, No. 56, Vol. 3, 1868, reports a cure with this remedy. The disease had resisted treatment for three years, and during the last two months had become very severe. Half-grain doses were given thrice daily, and in eight days the paroxysms were reduced to one in twenty-four hours. With this amelioration of the disease, the pulse diminished in frequency, and sound sleep was procured. The medicine was then continued until a perfect cure was effected.

NEKROSOZIAC, OR EMBALMING.

A new mode of embalming has been introduced in New York, and is thus described:

Over two hundred members of the medical faculty assembled on Friday, April 24th, in the anatomical museum attached to the Bellevue Hospital, to be present at an autopsy of the body of a female, aged about 30, dead 76 days, which had been preserved in life-like freshness by a new process of embalming called "nekrosoziac." Prof. Doremus presided over the autopsy, in which several of the most distinguished physicians and surgeons of the city participated. This new process of embalming consists simply in a wash of the deceased body without wound or incision. Some of its specialties are to dispense with the old system, disemboweling and extracting the brain; also avoiding mutilation or injection of any kind, and acting as a thorough disinfectant. The body operated upon this day was not in the slightest degree discolored; the features were as in life, and the smell as inoffensive as of a body twenty-four hours after death. The opening of the body revealed the fact that the bowels and brains, as well as the flesh, were free of the slightest appearance of taint or of smell. The limbs were as pliable as in life. Several of the surgeons spoke in high terms of the extraordinary discovery as likely to work a revolution in the preservation and transportation of dead bodies. Another body preserved by the same process for one hundred and three days has been subjected to an equally satisfactory examination.—*Pacific Medical Journal*.

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The Fourteenth Annual Session, 1869-'70.

PRELIMINARY LECTURES AND INSTRUCTIONS.—The Dispensary and Laboratory of the College will be opened on the 1st of September, where ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability; and during October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday in November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation,

and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

ANATOMY AND SURGERY.

The instruction in this department will embrace a plain and comprehensive view of the structure of the human body. The lectures and the demonstrations will be given over *the dead body dissected for the express purpose* of elucidating the subject. With the same object, vivisections on the lower animals, while under the influence of an Anæsthetic Agent, will be employed. Such description of the comparative anatomy, microscopical structure and connections of the teeth, as their importance may demand, will be fully given. The valuable and extensive collections of Anatomical Preparations of the incumbent of this chair, consisting of wet and dried specimens, papier mache manikins, models in wood, and accurate French plates, will enable him to illustrate his course of lectures very clearly.

In addition to the above course, a Surgical Clinic will be held by Doctor Forbes during every week, for the purpose of performing such operations in oral and general Surgery as may be deemed advisable to advance the student in this particular branch of knowledge. The cases will be selected from a dispensary which the Faculty have established.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical peculiarities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND HYGIENE.

The intention of the course on PHYSIOLOGY AND HYGIENE will be to convey a knowledge of the essential principles of general and human physiology, in such a mode as will best develop their application to the preservation of health. The subjects of physiology and hygiene will be, to some extent, interwoven, with a constant aim at clearness and simplicity of instruction.

CLINICAL INSTRUCTIONS.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the Demonstrators.

IN THE OPERATIVE DEPARTMENT.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

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VOL. V.

JULY, 1867.

NO. I.

THE
DENTAL TIMES,
A
QUARTERLY JOURNAL
OF
DENTAL SCIENCE.

EDITED AND PUBLISHED BY

DRS. T. L. BUCKINGHAM,
G. T. BARKER,

E. WILDMAN,
W. S. FORBES,

AND
JAMES TRUMAN,

FACULTY

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TO THE PROFESSION.

In issuing the "DENTAL TIMES," we desire to make it of interest to the mass of practitioners. To this end we earnestly solicit from our professional friends, communications on any branch of our specialty. To those who hesitate because their limited time incapacitates them for writing long or elaborate articles, we would say, give us the facts and the method, and we will lay them before our readers so that all will understand and many be instructed.

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After a trial of some weeks of Morgan's Plastic Gold, I am prepared to state that thus far it has fully equalled my expectations. I consider it a valuable contribution to Operative Dentistry.

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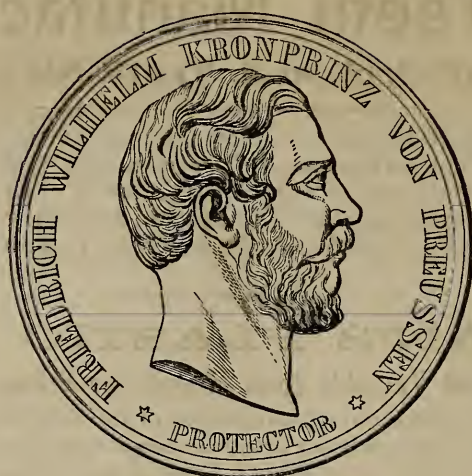
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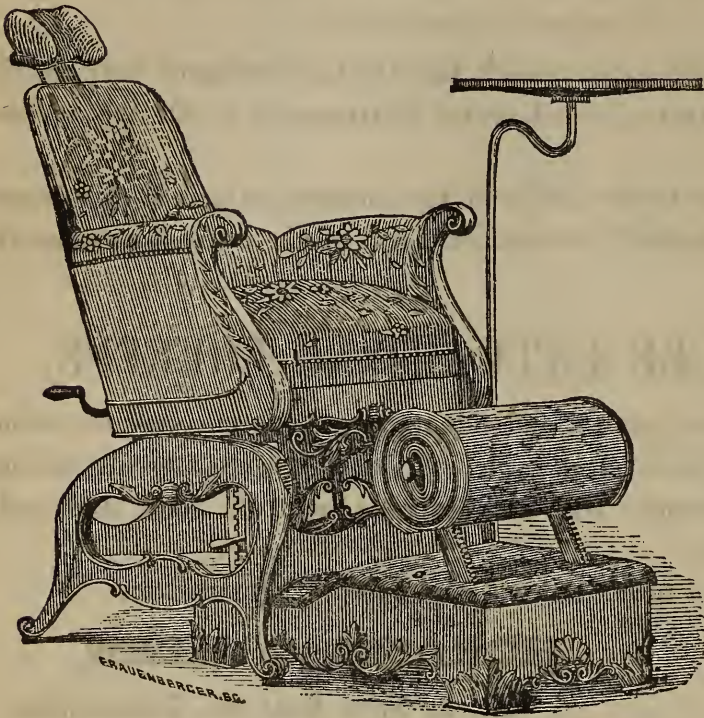
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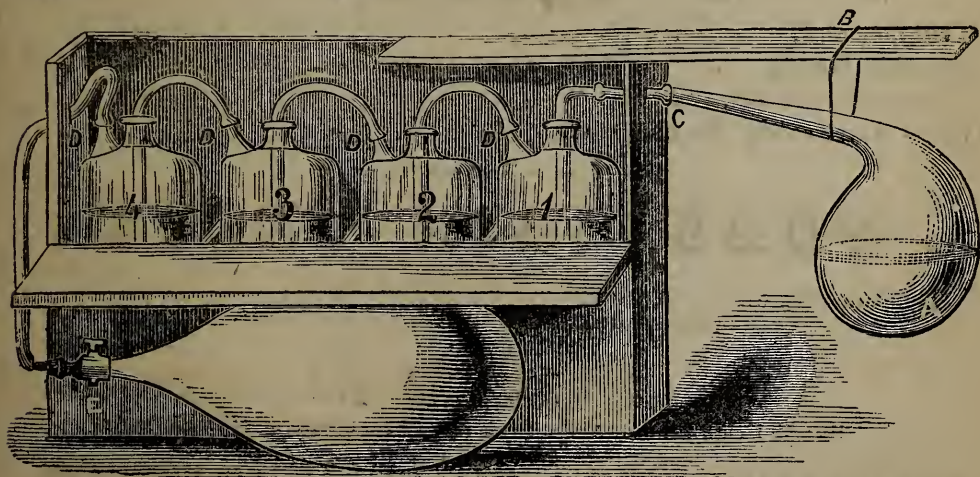
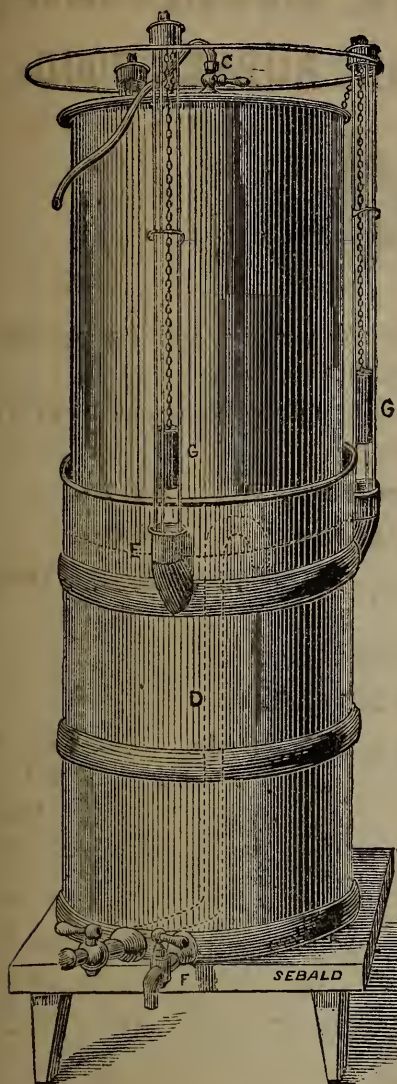
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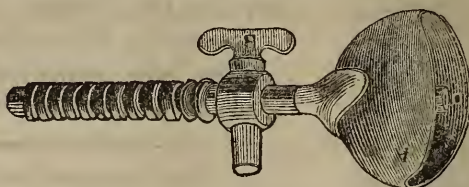


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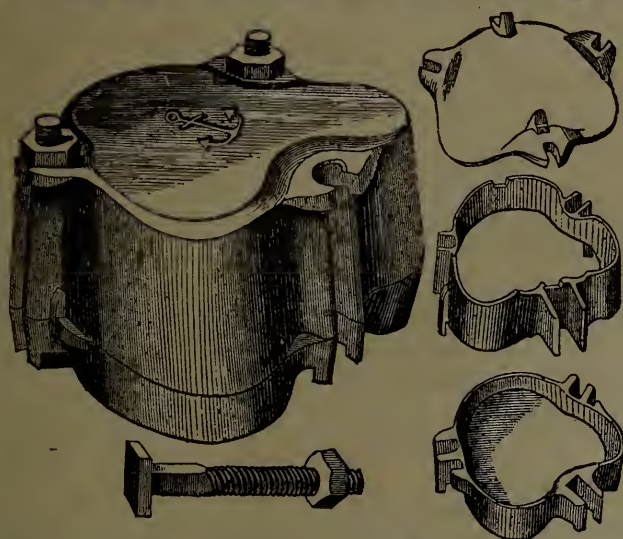
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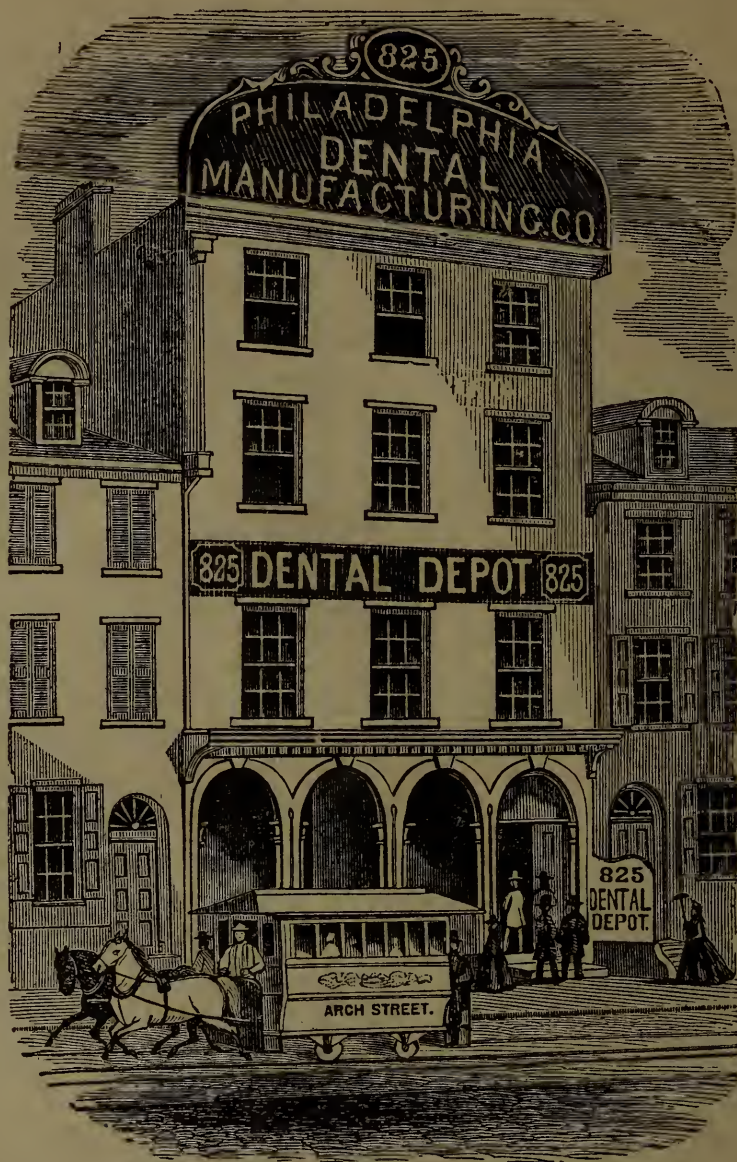


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VOL. V.

OCTOBER, 1867.

NO. 2.

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A
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DENTAL SCIENCE.

EDITED AND PUBLISHED BY

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G. T. BARKER,

E. WILDMAN,
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THOS. C. STELLWAGEN, D.D.S.,

Demonstrator of Operative Dentistry, Philada. Dental College.

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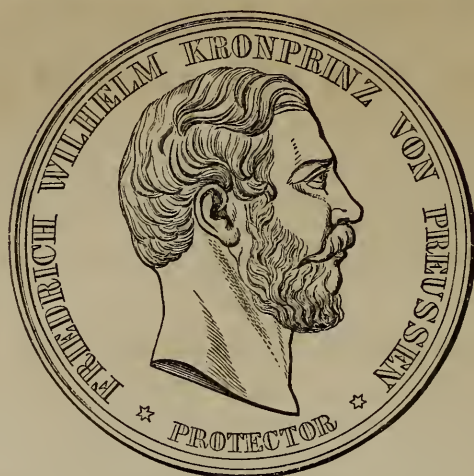
I have tested Morgan's Plastic Gold for some weeks most thoroughly, and have been *forced* against previous prejudice to regard its working qualities superior to any filling material ever submitted to the profession. I believe it possible, by its use, to perform operations uniformly better, and in much shorter time than foil. GEO. C. LOAR.

After having used D. Morgan's "Plastic Gold," for filling teeth in my practice for some weeks, I feel no hesitation in pronouncing it, in my opinion, superior to any other preparation of Gold yet offered. I deem it a valuable acquisition in Operative Dentistry. S. DILLINGHAM.

Some weeks experience with Morgan's Plastic Gold, has proven it, in my opinion, superior to foil in the ease and rapidity of its manipulation. W. C. HEAD.

I have used Morgan's Plastic Gold for some time, and consider it the best filling material ever offered to the profession. SAMUEL J. DICKEY.

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
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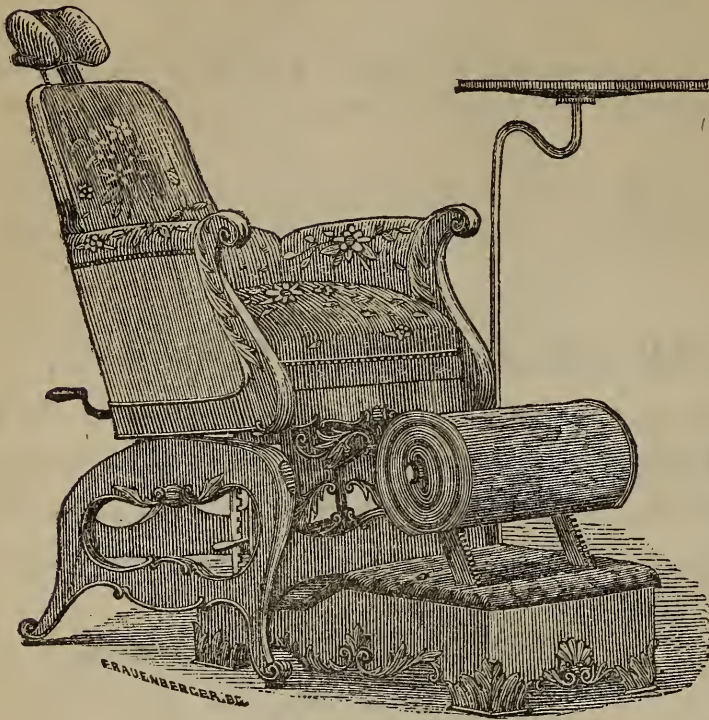
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Dentists wishing to try Vulcanite Base, can have a few cases made at a reduced price.

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Being largely interested in the new organization, we will be present to attend to your orders as usual. While having greatly increased facilities, we feel better than ever prepared to meet your wishes, which we will, at all times, endeavor to do to your satisfaction.

With thanks for past favors, we are,

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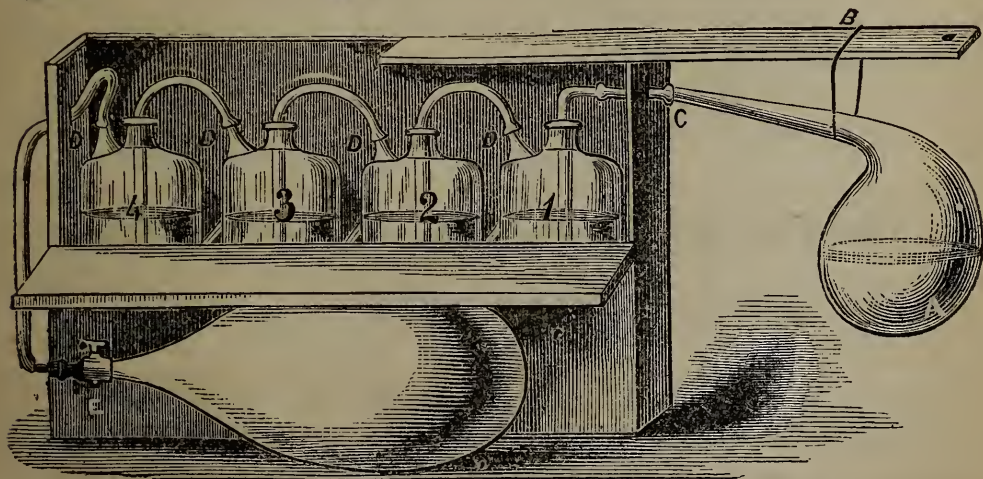
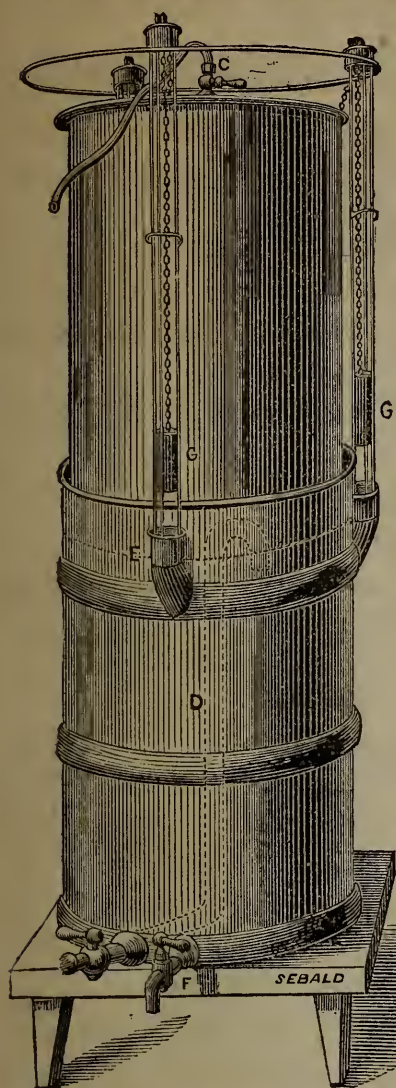
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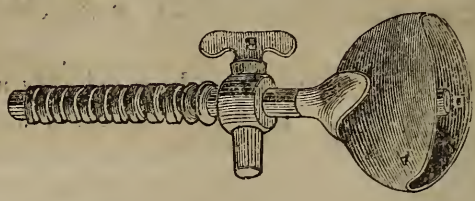


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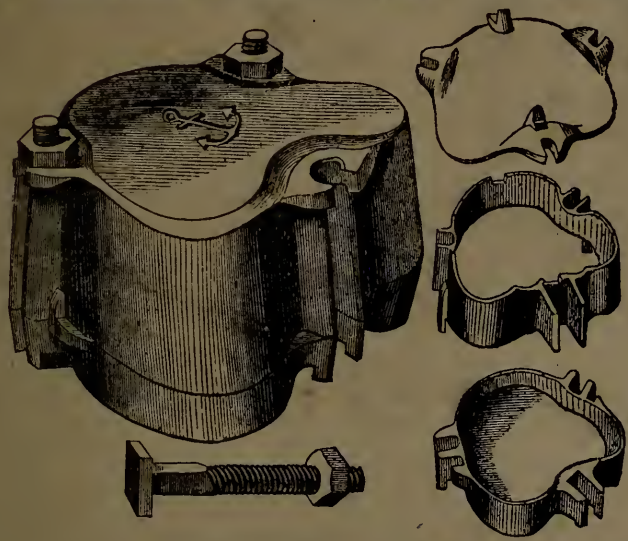
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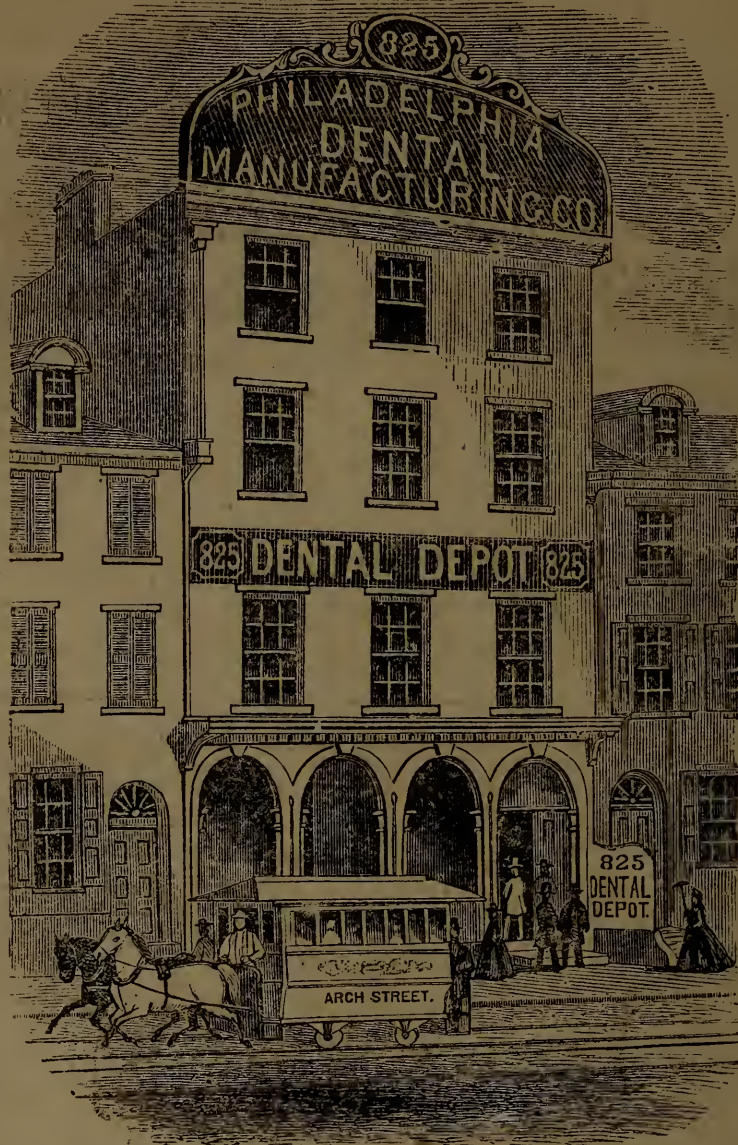


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VOL. V.

JANUARY, 1868.

NO. 3.

THE
DENTAL TIMES,
A
QUARTERLY JOURNAL
OF
DENTAL SCIENCE.

EDITED AND PUBLISHED BY

DRS. T. L. BUCKINGHAM,
C. T. BARKER,

E. WILDMAN,
W. S. FORBES,

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FACULTY

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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

EDITED AND PUBLISHED BY THE

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It is not acted upon by the Fluids of the Mouth;

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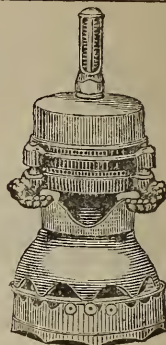
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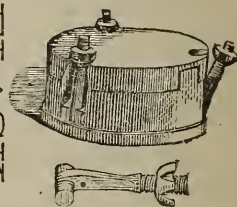
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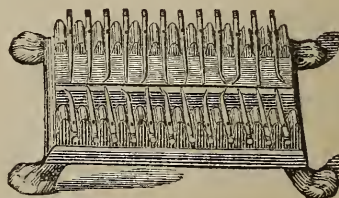
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Having used Morgan's Plastic Gold for the past three months, I feel willing to express myself favorably as to the superiority of its working qualities.

J. FOSTER FLAGG, D.D.S.,

Professor of Institutes of Dentistry, Philadelphia Dental College.

Having used for some weeks Mr. Morgan's Plastic Gold, I am prepared from my experience to say that the average quality of my work is raised by its use.

LOUIS JACK.

After a trial of some weeks of Morgan's Plastic Gold, I am prepared to state, that thus far it has fully equalled my expectations. I consider it a valuable contribution to Operative Dentistry.

GEO. T. BARKER, D.D.S.,

Prof. of Dental Pathology & Therapeutics, Penna. College of Dent. Surgery.

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Some weeks experience with Morgan's Plastic Gold, has proven it, in my opinion, superior to foil in the ease and rapidity of its manipulation.

W. C. HEAD.

I have used Morgan's Plastic Gold for some time, and consider it the best filling material ever offered to the profession.

SAMUEL J. DICKEY.

ARTIFICIAL TEETH.



PRIZE MEDAL

AWARDED TO

JOHNSON & LUND,

AT THE

**WORLD'S FAIR IN PRUSSIA,
1865,**

FOR EXCELLENCE IN THE MANUFACTURE OF ARTIFICIAL TEETH

The attention of Dentists is called to our late patterns of

BLOCK TEETH FOR RUBBER BASE.

In claiming for them

BEAUTY, NATURAL APPEARANCE & TOUGHNESS,

We are endorsed by all who have given them a trial, as well as by the fact that we have just received a PRIZE MEDAL at the World's Fair in Prussia, for excellence in the manufacture of Artificial Teeth.

Our assortment of Block Teeth for Rubber Base is quite varied.

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Blocks or Sections for Rubber Base,.....	20 cents.
Single Gum Teeth, " "	20 "
" " Plate Work,.....	20 "
Plain Teeth, for Plate Work.....	10 "
" " for Rubber Work.....	10 "
Pivot Teeth,.....	8 "

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Our Teeth for Rubber Work have DOUBLE-HEADED PINS. These are distinct and well formed. One of them is really inserted in the tooth, the other is at the extremity of the pin, OUTSIDE. We thus secure a firm resistance in the body of the tooth, and ample space for the retention of the rubber around the pin outside. Our customers pronounce them "Excelsior."

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ESTABLISHED
1837.

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
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Plate Shears.

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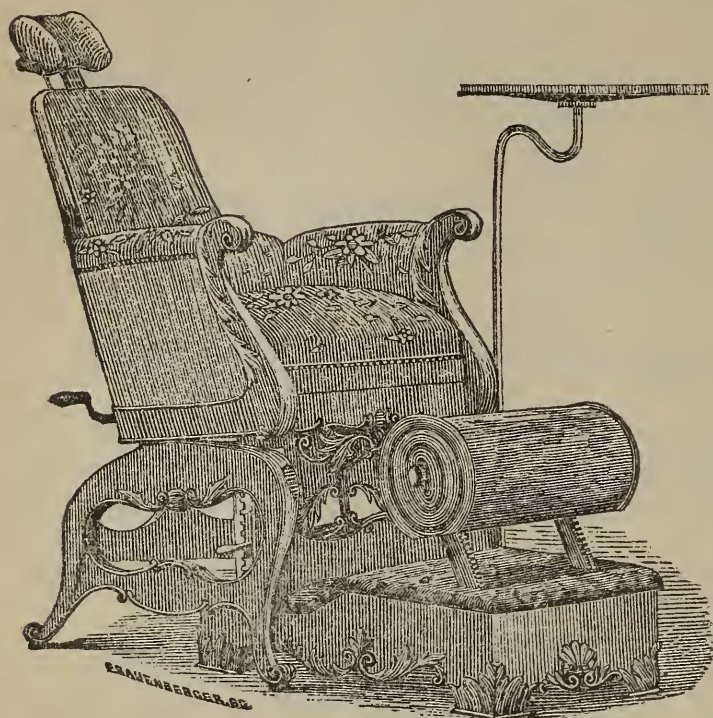
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LIST OF PRICES.

FOR ALCOHOL & GAS



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No. 2, with two flasks, wrenches, &c., complete for use, for alcohol or gas,.....	\$15 75
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Flask, “ “ “	10
Packings, per piece,	5
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Gas burner,.....	50
Kerosene stove, with jacket to fit vulcanizer,	2 75
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The kerosene stove is a *good thing*, suited to all vulcanizers.

All orders, *with cash*, promptly attended to.

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For sale by all dealers in *Dental Materials* and by the undersigned.

One-fourth ounce packages, with directions, sent by mail free of postage, on receipt of \$1.

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Assorted, will be sent by mail, free of charge, to those desiring them.

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Capacity, 40 gallons. Price, \$35.

This being simply a Gasometer, can be used in connection with any Generator.

The illustration below represents our
New and Greatly Improved Apparatus

FOR THE MANUFACTURE OF

NITROUS OXIDE.

It possesses many advantages over any now in use or offered to the profession, being complete and perfect in all its parts, simple in its arrangement, and cannot get out of order.

The jars are fitted up WITHOUT PLASTER OR CEMENT, and the joints so perfect as to prevent the possibility of leakage, to which those constructed differently are so liable.

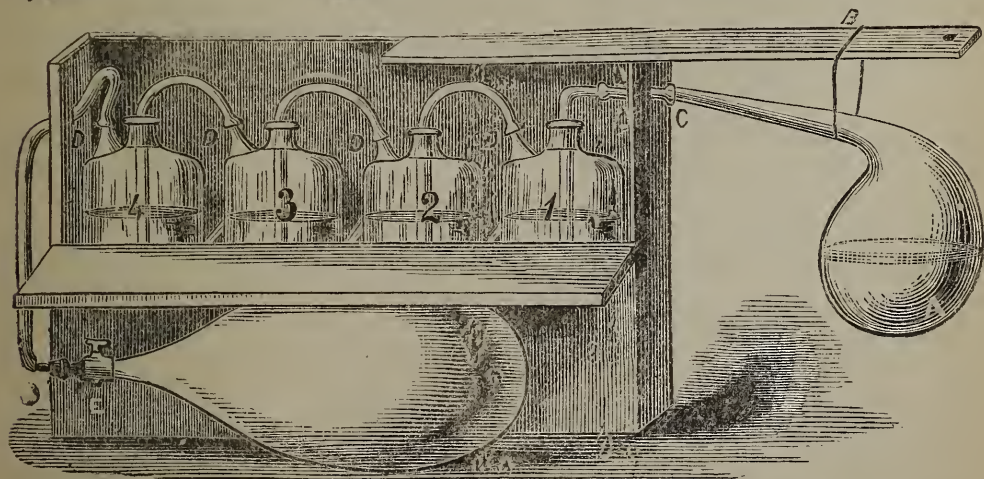
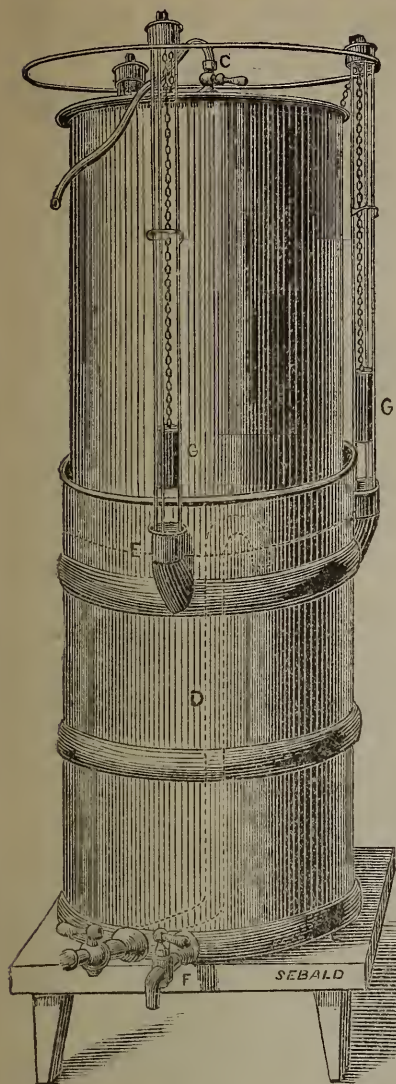
By means of this Apparatus, the Gas can be made in the shortest possible time, without difficulty, and perfectly free from all deleterious ingredients.

Price, complete as represented, with Four Jars, Retort, Seven-Gallon Inhaling Bag and Rubber Mouth-piece. \$23 00. Extra Boxing, \$1 00.

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Full instructions for making the Gas accompany each Apparatus.

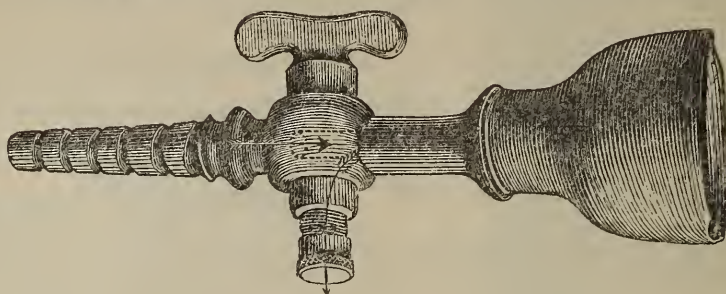
Many of these are now in successful operation and giving entire satisfaction.



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WITH
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Ammonia, Fused, per lb.	65
Mouth-piece, Plain,	2.00
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" " and Trumpet End,	4.75
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Trumpet end,	75
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Chemicals, per set,	50
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Kerosene Oil Stove, 2 burners,	3.00

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IN THE
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NITROUS OXIDE,
PROTOXIDE OF NITROGEN OR LAUGHING GAS,
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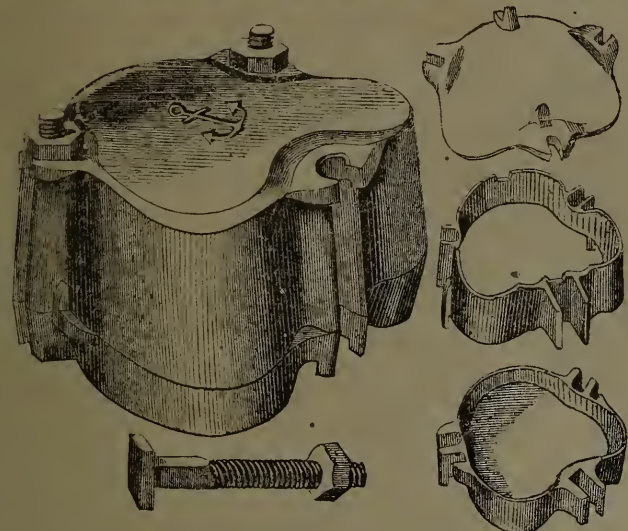
BY GEO. T. BARKER, D. D. S.,
Professor of Principles of Dental Surgery and Therapeutics in the
Pennsylvania College of Dental Surgery.

Philadelphia Dental Manufacturing Company,

PHILADELPHIA, 1867.

Price, one dollar.

THE ANCHOR FLASK.

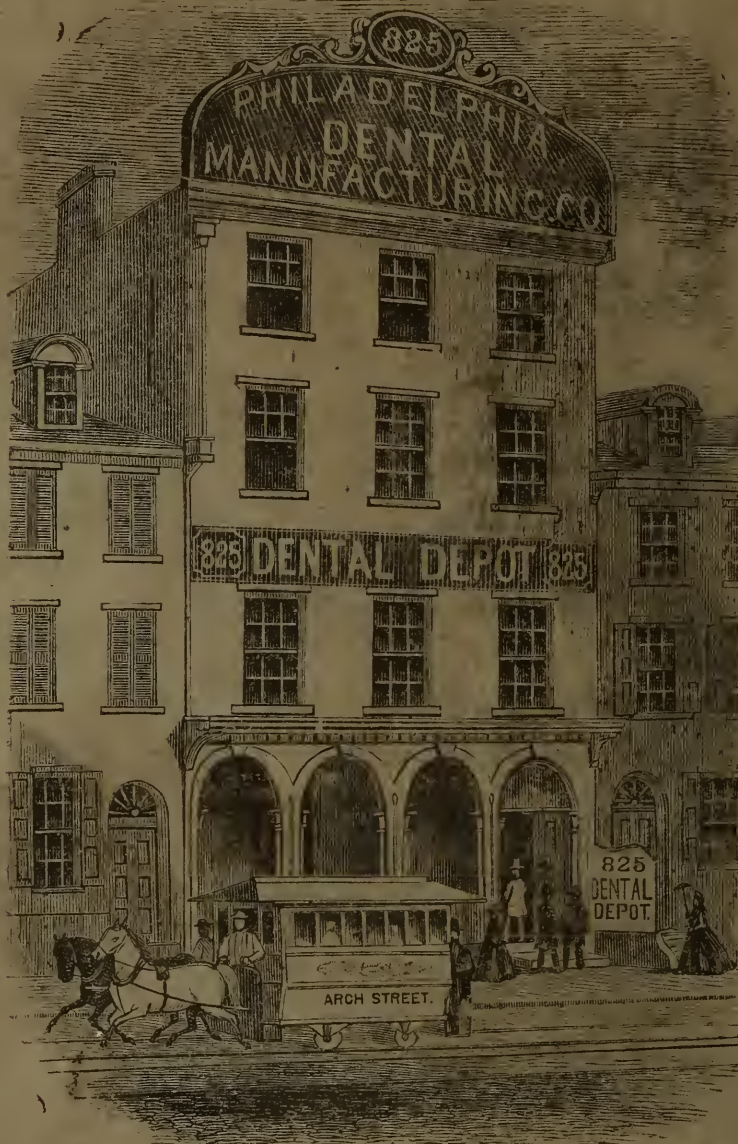


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We particularly recommend this Flask to your notice, as it has no superior, and is giving entire satisfaction in all respects.

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" Iron, Tinned.....	1 50
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" Bolt and Nut.....	10
" Wrench.....	10

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SUCCESSORS TO

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VOL. V.

APRIL, 1868.

NO. 4.

THE
DENTAL TIMES,
A
QUARTERLY JOURNAL
OF
DENTAL SCIENCE.

EDITED AND PUBLISHED BY

DRS. T. L. BUCKINGHAM,
G. T. BARKER,

E. WILDMAN,
W. S. FORBES,

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H. HARTSHORNE,

FACULTY

OF THE

Pennsylvania College of Dental Surgery.

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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

EDITED AND PUBLISHED BY THE

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A Beautiful and Excellent Preparation for Filling Teeth.

For this new combination of metals, (chemically pure,) for dental purposes, great superiority is claimed over ordinary amalgams. It will remain bright for years, and *when used according to directions*, will preserve teeth more perfectly than any article in use, except gold; and under many circumstances can be successfully used for the permanent preservation of teeth when gold would prove a failure in the hands of a large majority of operators.

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The increasing demand for a reliable amalgam has prompted the introduction of this article, with the confidence that it will give entire satisfaction to those who use it rightly.

To manufacture a superior amalgam, always uniform in quality and texture, at a moderate cost, it is necessary to make it in large lots and by the aid of machinery. It is also necessary that each lot be thoroughly tested by a competent dentist before offering it for sale.

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To meet the ideas of different operators, two grades are manufactured, (same quality,) differing only in fineness, (No. 1, fine, No. 2, medium coarse,) securely put up in quarter, half and one ounce packages, with printed directions inclosed, with TRADE MARK of manufacturer on each package and circular.

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It affords me pleasure to announce to my professional brethren, that I have been using, with great success, in my practice for several months,

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Pat. Mar. 5, 1861, Apr. 3, 1866.

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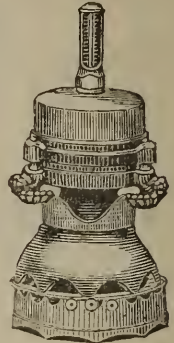
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" "	37½ "
" clamp,	50 "

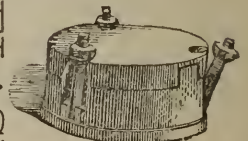
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Iron Clad Oven.



Iron Clad Boiler.



SNOW & LEWIS' IMPROVED AUTOMATIC PLUGGER.



Patented Oct. 30, and Nov. 20, 1865.

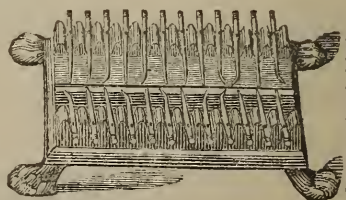
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Professor of Institutes of Dentistry, Philadelphia Dental College.

Having used for some weeks Mr. Morgan's Plastic Gold, I am prepared from my experience to say that the average quality of my work is raised by its use.

LOUIS JACK.

After a trial of some weeks of Morgan's Plastic Gold, I am prepared to state, that thus far it has fully equalled my expectations. I consider it a valuable contribution to Operative Dentistry.

GEO. T. BARKER, D.D.S.,

Prof. of Dental Pathology & Therapeutics, Penna. College of Dent. Surgery.

I have used Morgan's Plastic Gold for a short time, and have been much pleased with its working qualities.

E. WILDMAN, D.D.S.,

Prof. of Mechanical Dentistry & Metallurgy, Penna. College of Dent. Surgery.

From the manner in which I have found the specimens of Morgan's Plastic Gold capable of being worked, I am impressed with the belief that it greatly facilitates operations, and enables one to obtain most excellent results as to adaptation and solidity with comparative ease and speed.

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Demonstrator of Operative Dentistry, Philada. Dental College.

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S. DILLINGHAM.

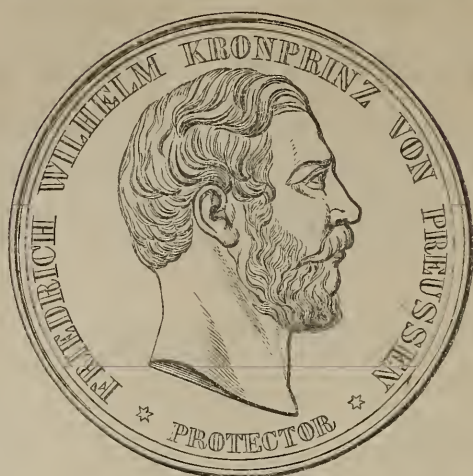
Some weeks experience with Morgan's Plastic Gold, has proven it, in my opinion, superior to foil in the ease and rapidity of its manipulation.

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
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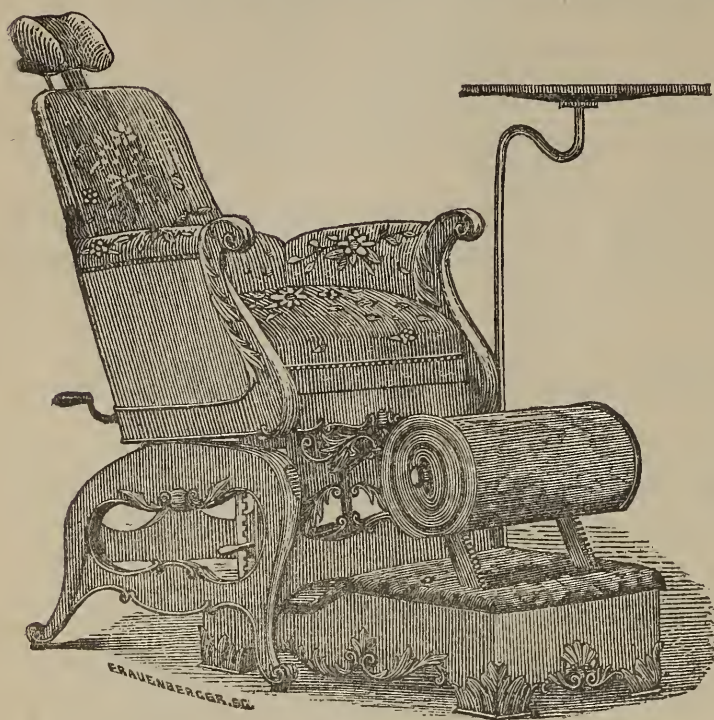
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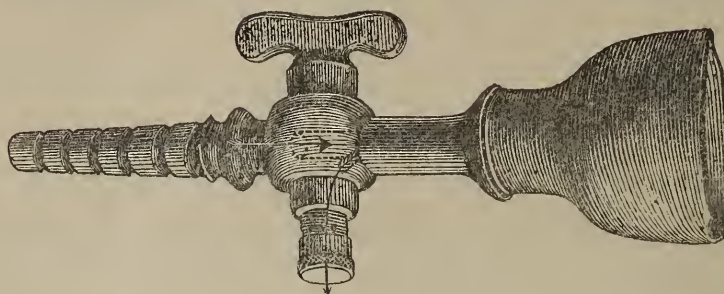
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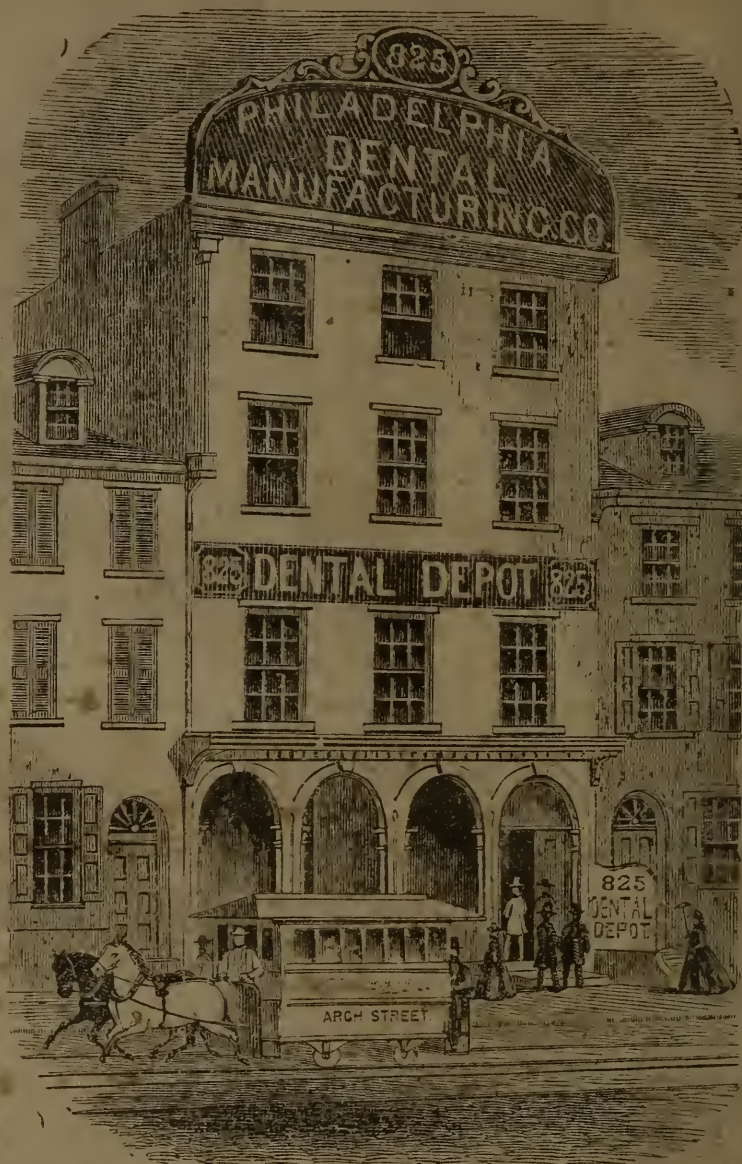


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VOL. VI.

JULY, 1868.

NO. 1.

THE
DENTAL TIMES,
A
QUARTERLY JOURNAL
OF
DENTAL SCIENCE.

PUBLISHED BY THE

FACULTY

OF THE

Pennsylvania College of Dental Surgery.

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T. YARDLEY BROWN, D. D. S., Reading, Pa.

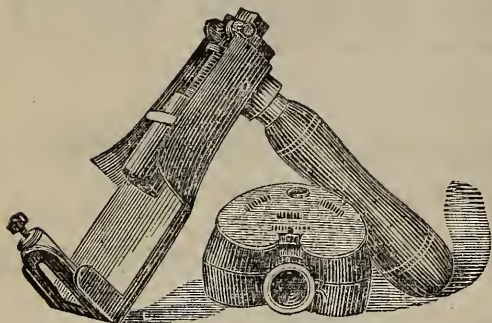
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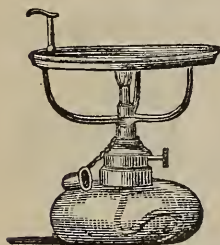
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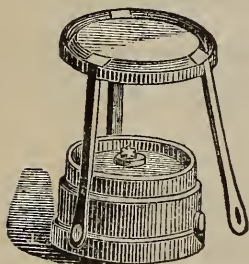
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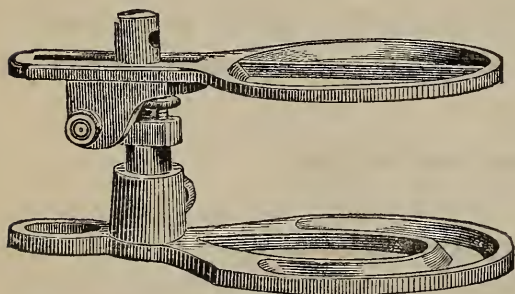


This is a new invention for the purpose of closing the flask in the vulcanizer, while the rubber from the greater heat, is more plastic than it can be made outside. It saves the annoyance of handling hot and dirty flasks, and almost entirely does away with the danger of breaking blocks.

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JOHNSON & LUND,

AT THE

**WORLD'S FAIR IN PRUSSIA,
1865,**

FOR EXCELLENCE IN THE MANUFACTURE OF ARTIFICIAL TEETH

The attention of Dentists is called to our late patterns of

BLOCK TEETH FOR RUBBER BASE.

In claiming for them

BEAUTY, NATURAL APPEARANCE & TOUGHNESS,

We are endorsed by all who have given them a trial, as well as by the fact that we have just received a PRIZE MEDAL at the World's Fair in Prussia, for excellence in the manufacture of Artificial Teeth

Our assortment of Block Teeth for Rubber Base is quite varied.

PRICES.

Blocks or Sections for Rubber Base,.....	20 cents.
Single Gum Teeth, " "	20 "
" " Plate Work,.....	20 "
Plain Teeth, for Plate Work.....	10 "
" " for Rubber Work.....	10 "
Pivot Teeth,.....	8 "

NOTICE.

Our Teeth for Rubber Work have DOUBLE-HEADED PINS. These are distinct and well formed. One of them is really inserted in the tooth, the other is at the extremity of the pin, OUTSIDE. We thus secure a firm resistance in the body of the tooth, and ample space for the retention of the rubber around the pin outside. Our customers pronounce them "Excelsior."

A Liberal Discount made to Wholesale Dealers.

JOHNSON & LUND.

ESTABLISHED
1837.

HORATIO G. KERN,

ESTABLISHED
1837.

MANUFACTURER OF

SURGICAL AND DENTAL INSTRUMENTS, &C.

The subscriber would again remind the Dental Profession that he still continues to manufacture his celebrated Instruments in all the various branches.

Assiduous attention to the details of the business, which an experience of thirty years has afforded, has enabled him to make many improvements in his

UNRIVALLED EXTRACTING FORCEPS,

Both as regards their quality and adaptation to the purposes for which they are intended, a desideratum which will be appreciated by all wishing to purchase Instruments, that are reliable and of long and well established reputation.

All orders entrusted to his care will be promptly attended to.

HORATIO G. KERN,

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Vulcanizers,

Dental Files,

Impression Cups,

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Foil Shears,

Atomizers,

Rubber Files,

File Carriers,

Bur Drills,


Plate Shears.

SLIDING NERVE SOCKETS AND BITS

PORCELAIN TEETH AND DENTISTS' MATERIALS.

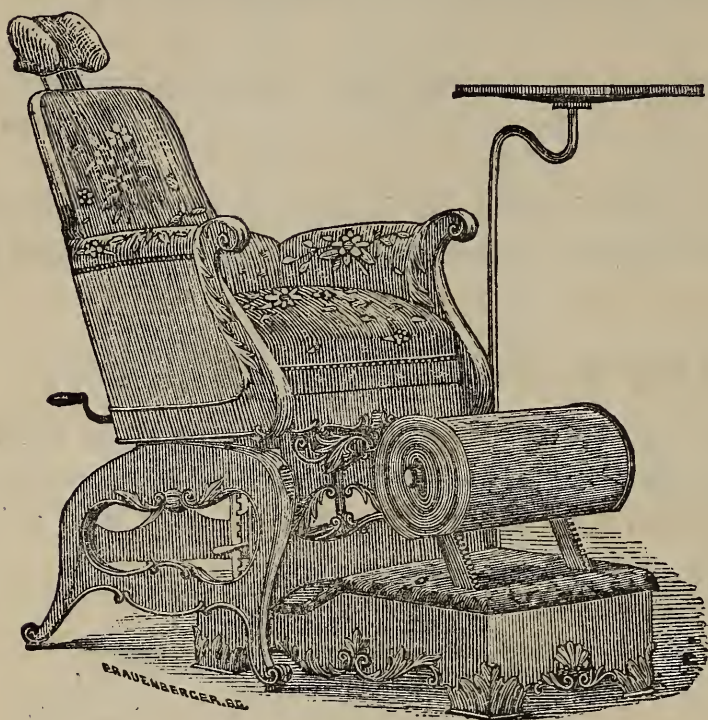
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Patented September 4, 1860.



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R. W. ARCHER, Rochester, N. Y.
Sold at all the principal Dental Depots in this country.

CHARLES ABBEY & SONS,
MANUFACTURERS OF
DENTISTS' FINE GOLD AND TIN FOIL,
NOS. 228 & 230 PEAR STREET,
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The attention of Dentists is invited to our **FINE GOLD FOIL**, which is prepared under our constant personal supervision. Our Nos. are 4, 5, 6, and 8.

We are also manufacturing an **ADHESIVE FINE GOLD FOIL**, Nos. 4, 5 and 6.

ALL our Gold Foil is manufactured from **ABSOLUTELY PURE GOLD**, prepared expressly for the purpose, with great care, by ourselves.

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The Subscriber is obliged to retire from business immediately, and to do so and bring my terms within the reach of any worthy party, I will ask nothing for good will and the work engaged, and will rent a portion of Furniture and Tools, provided the applicant has not the means to purchase the whole.

My Prices are as high as any in the State, and my Office consists of four rooms, elegantly furnished. This is a rare chance for a young man who understands his business, as I will take pains to have him succeed.

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Care of DAWSON WOODRUFF, Attorney-at-Law,

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MANUFACTURER OF TEETH,

REMOVED TO

No. 621 SOUTH TENTH ST.,

Where he has for sale a large assortment of the LATEST IMPROVED TEETH for all kinds of Rubber and Plate Work, with Double-Headed Pins; together with an assortment of all kinds of DENTAL INSTRUMENTS and other articles needed by the Profession.

All orders promptly filled.

ROBERTS' OS-ARTIFICIAL

A substitute for AMALGAM in filling badly decayed teeth; and used for resetting PIVOT TEETH in badly decayed roots; also for filling over SENSITIVE DENTINE to destroy sensibility, and as a non-conductor of heat, and for many other DENTAL PURPOSES.

For sale by all dealers in *Dental Materials* and by the undersigned.

One-fourth ounce packages, with directions, sent by mail free of postage, on receipt of \$1.

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I would respectfully inform the DENTAL PROFESSION that my Laboratory has been REMOVED TO 100 NORTH TENTH STREET, where, after having made considerable improvements in my style of carving and enamels, with assistants also, I am now enabled to execute all orders with promptness and despatch.

Dentists wishing to try Vulcanite Base, can have a few cases made at a reduced price.

WM. R. HALL,

100 North Tenth Street, Philadelphia.

P. D. M. CO.

Special Notice to the Dental Profession.

PORCELAIN TEETH.

STRENGTH! BEAUTY!! VARIETY!!!

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REDUCTION IN OUR PRICES,

And, therefore, take this method of informing the Dental Profession that the following are the rates at which we will furnish our superior Teeth:

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Gum Teeth 16 Cents Each.

When ordered by the quantity, we will furnish them at the following prices for *cash only*:

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Gum Teeth 16 Cents Each.

For \$25.00, 20 sets of 14 Plain Teeth, (280) being a fraction less than 9c. each.

For \$50.00, 42 sets of 14 Plain Teeth, (588) being a fraction over 8½c. each.

For \$100.00, 89 sets of 14 Plain Teeth, (1246) being a fraction over 8c. each.

SAMPLES OF ANCHOR SECTIONS

Assorted, will be sent by mail, free of charge, to those desiring them.

These will enable the Dentist to decide as to the pattern best suited to any particular case, which can be ordered by the number on back of sample. They will be found very useful.

PHILADELPHIA DENTAL MANUFACTURING CO.

Depot, 825 Arch Street.

Philadelphia Dental Manufacturing Company.

IMPROVED DENTAL RUBBER,

\$6.00 Per Pound.

(SIMPSON'S PATENT, ISSUED OCTOBER 16TH, 1866.)

Manufactured by

A. R. HALE,

The following Guarantee accompanies each box containing a pound of the Rubber:

GUARANTEE.

The undersigned hereby agrees to, and with the purchaser of this package of DENTAL RUBBER, that he will, in consideration of such purchase, protect such purchaser from all loss, cost or damage arising out of any suits in Law or Equity, brought against him under the Patent Laws of the United States for using the same for DENTAL PURPOSES, and will defend against any and all such suits, at his own expense, upon reasonable notice and demand.

(SIGNED,)

A. R. HALE,

Manufacturer.

Sold by the Philadelphia Dental Manufacturing Company

SUPERIOR DENTAL PLASTER.

Manufactured under our direction, expressly for Dental Purposes, and decidedly the best article in the Market.

Six quart Iron Cans,	-	-	-	\$	75
Twelve quart Iron Cans,	-	-	-		1 25
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Three peck Iron Cans,	-	-	-		2 25
Eight quart Wood Pails,	-	-	-		1 00
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Quarter Barrel,	-	-	-	-	2 00
Half Barrel,	-	-	-	-	3 25
Barrel,	-	-	-	-	4 75

Porterage extra.

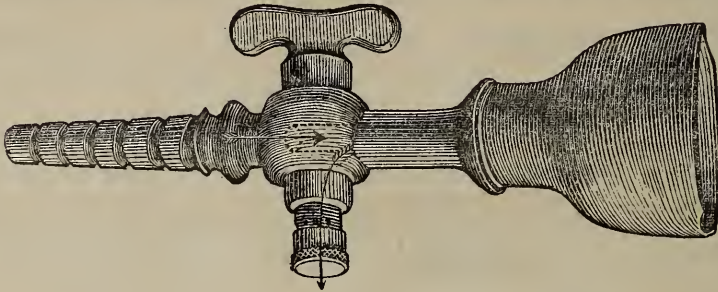
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IMPROVED
DOUBLE-VALVE MOUTH-PIECE,
WITH
DR. BARKER'S FLEXIBLE RUBBER HOOD.



This is considered the *best arrangement for the purpose*, and its use has been ADOPTED BY THE MOST EXPERIENCED OPERATORS.

The Hood covers both mouth and nose, while one valve opens at every inhalation and the other at every exhalation.

Having a supply of these, we are now prepared to fill orders for them promptly.

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Gas Generator, including Four Jars, Retort and Chemicals,	\$15.00
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" Plain,	75
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" " and Trumpet End,	4.75
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Kerosene Oil Stove, 2 burners,	3.00

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NEW EDITION.
INSTRUCTIONS

IN THE

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PROTOXIDE OF NITROGEN OR LAUGHING GAS,

FOR DENTAL AND SURGICAL PURPOSES,

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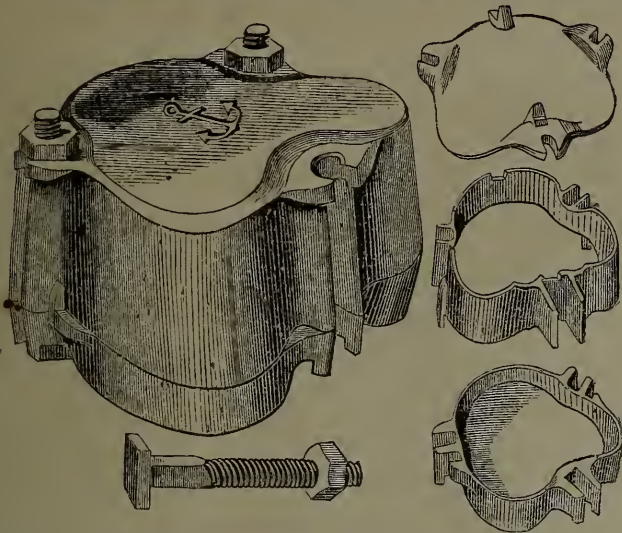
Professor of Principles of Dental Surgery and Therapeutics in the
Pennsylvania College of Dental Surgery.

Philadelphia Dental Manufacturing Company,

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Price, one dollar.

THE ANCHOR FLASK.

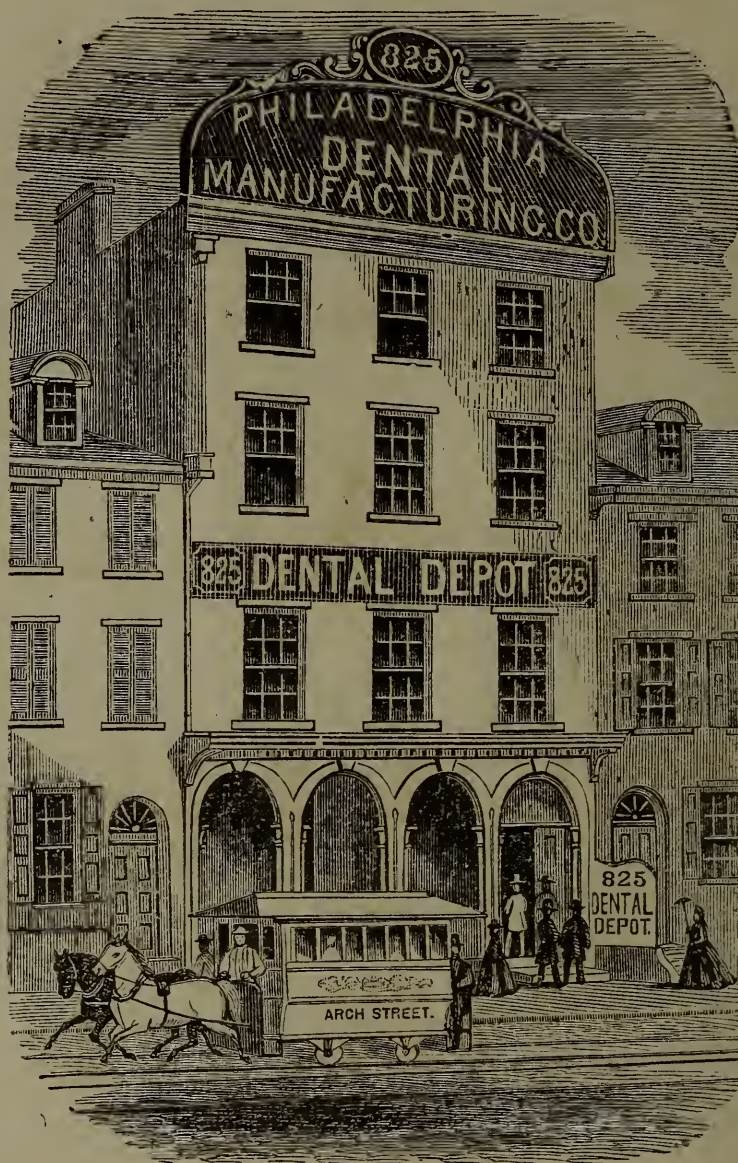


THE LATEST! THE STRONGEST! THE BEST!

We particularly recommend this Flask to your notice, as it has no superior, and is giving entire satisfaction in all respects.

Price, Brass.....	\$2 00
" Iron, Tinned.....	1 50
" ".....	1 25
" Bolt and Nut.....	10
" Wrench.....	10

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Philadelphia Dental Manufacturing Co.
DEPOT, 825 ARCH STREET,
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SUCCESSORS TO

RUBENCAME & STOCKTON and W. A. DUFF & CO.,
 MANUFACTURERS OF

PORCELAIN TEETH, GOLD AND TIN FOIL,
 Dealers in every variety of INSTRUMENTS and MATERIALS required
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VOL. VI.

OCTOBER, 1868.

NO. 2.

CATALOGUE
P. H. B.
SEP 14 1889

THE

DENTAL TIMES,

A

QUARTERLY JOURNAL

OF

DENTAL SCIENCE.

BOSTON MEDICAL
SEP 10 1889
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FACULTY

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Pennsylvania College of Dental Surgery.

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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

PUBLISHED BY THE

FACULTY OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.


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REQUIRES LESS MERCURY THAN OTHERS.

*It does not Contract. It will not Oxide. And can be worked longer
than any other, and becomes VERY HARD in a short time.*

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TO THE DENTAL PROFESSION.

It affords me pleasure to announce to my professional brethren, that I have been using, with great success, in my practice for several months,

A SUBSTITUTE FOR RUBBER WORK,

And can demonstrate, beyond a shadow of a doubt,

ITS SUPERIORITY IN EVERY RESPECT TO RUBBER,

IN STRENGTH, BEAUTY AND DURABILITY.

It is not acted upon by the Fluids of the Mouth;

IS A GOOD CONDUCTOR, AND TASTELESS.

The method consists in the manner of attaching artificial teeth to swedged plates. When aluminum is used for upper sets, it

IS AS LIGHT AS RUBBER WORK,

And for lower cases,

CAN BE MADE AS HEAVY AS DESIRED.

Believing it to be the only perfect way of constructing artificial work, and desiring that the members of the Dental Profession try this method, as soon as possible, and save themselves from paying the burdensome rubber tax, I offer it to them on the following

TERMS:

OFFICE RIGHTS, FOR 17 YEARS, \$25,

Reserving the right of manufacturing the metal for attaching the teeth.

METAL FURNISHED BY DENTAL DEPOTS AT \$5 PER POUND

1 pound sufficient for 40 or 50 cases.

Those who desire to test this work, can send a swedged plate, fitted to the mouth, having the teeth set as desired, and fastened with hard wax. I will return the case finished for \$5.

EXTRACT FROM DEED:

Whereas, Letters Patent of the United States were granted to T. Yardley Brown, of the City of Reading, for an improvement in attaching artificial teeth to Swedged Plates, with a Fusible Metal or Alloy; which Letters Patent bear date the seventh day of January, 1868.

T. YARDLEY BROWN, D. D. S., Reading, Pa.

N. B. Full instructions given with Office Rights.

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PRICES.

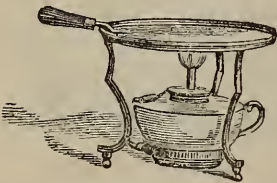
Bronzed, including table,.....	\$12 00
Silver Plated, ".....	15 00
With Gas and Annealing Lamp,.....	20 00
With Gas and Annealing Lamp, Silver Plated,.....	24 00
Bracket, without table, less.....	2 00

This Bracket will be found to be the strongest article of the kind in the market. The extension is effected by a rod sliding into a pipe. From the parts being always in line this Bracket will be found free from that unsteadiness which is inseparable from jointed ones. It is furnished either Bronzed or Silver Plated. The table is black walnut, velvet lined, and fourteen inches in diameter.

The Bracket is also made with a gas annealing apparatus; gas being brought in through the Bracket entirely out of sight, and coming up through the centre of the table.

Annealing attachment extra.

LEWIS' ANNEALING LAMP.

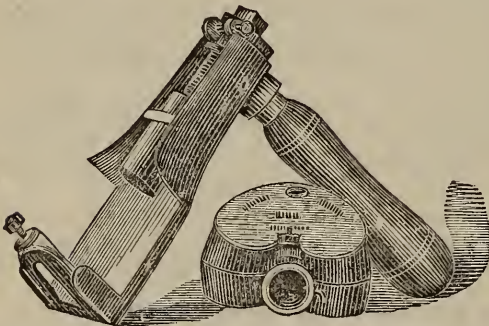


This consists of a brass ornamented tripod 3½ inches high, holding a tray 4 inches in diameter, with Britannia Lamp.

PRICES.

Lewis' Annealing Lamp,.....	\$2 50
Lewis' Annealing Lamp, Silver Plated,.....	4 00

HAYES' CONDENSING FLASK.



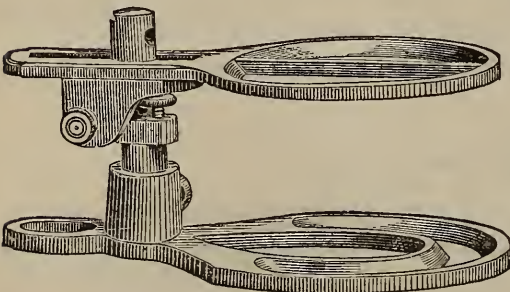
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Patented February 4th, 1868.

PRICE.

Complete with one Flask,.....	\$6 00
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SNOW & LEWIS' ARTICULATOR.



A New and Substantial Article.

This Articulator is strong and well fitted throughout, and is capable of being raised and lowered to accommodate full or half sets.

PRICE.

Snow & Lewis' Articulator,.....	\$2 00
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BALTIMORE, Md

ARTIFICIAL TEETH.



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AT THE

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File Carriers,

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
Plate Shears.

SLIDING NERVE SOCKETS AND BITS.

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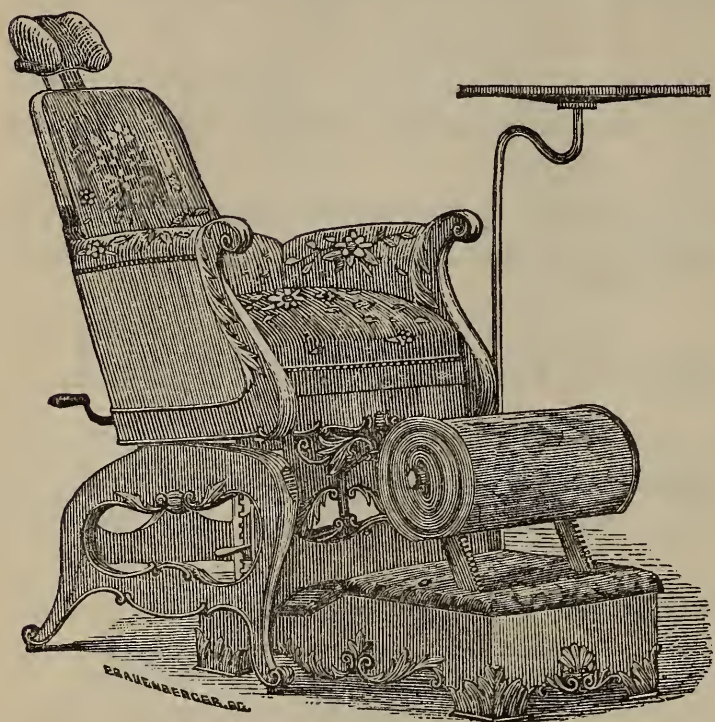
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Where he has for sale a large assortment of the LATEST IMPROVED TEETH for all kinds of Rubber and Plate Work, with Double-Headed Pins; together with an assortment of all kinds of DENTAL INSTRUMENTS and other articles needed by the Profession.

All orders promptly filled.

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A substitute for AMALGAM in filling badly decayed teeth; and used for resetting PIVOT TEETH in badly decayed roots; also for filling over SENSITIVE DENTINE to destroy sensibility, and as a non-conductor of heat, and for many other DENTAL PURPOSES.

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One-fourth ounce packages, with directions, sent by mail free of postage, on receipt of \$1.

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BLOCK TEETH AND VULCANITE.

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Dentists wishing to try Vulcanite Base, can have a few cases made at a reduced price.

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100 North Tenth Street, Philadelphia.

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Special Notice to the Dental Profession.

PORCELAIN TEETH.

STRENGTH! BEAUTY!! VARIETY!!!

Having greatly increased our facilities and added largely to our variety of patterns of teeth, we are encouraged, by the growing demand, to make a

REDUCTION IN OUR PRICES,

And, therefore, take this method of informing the Dental Profession that the following are the rates at which we will furnish our superior Teeth:

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Depot, 825 Arch Street.

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IMPROVED DENTAL RUBBER,

\$6.00 Per Pound.

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Manufactured by

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The following Guarantee accompanies each box containing a pound of the Rubber:

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(SIGNED,)

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Half bushel Wood Pails,	-	-	-		1 60
Bushel Wood Pails,	-	-	-	-	2 75
Quarter Barrel,	-	-	-	-	2 00
Half Barrel,	-	-	-	-	3 25
Barrel,	-	-	-	-	4 75

Porterage extra.

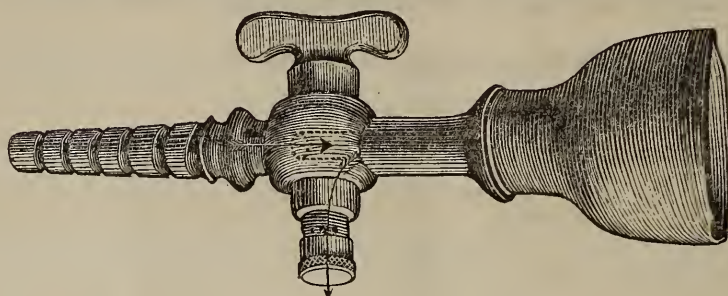
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PROTOXIDE OF NITROGEN OR LAUGHING GAS,
FOR DENTAL AND SURGICAL PURPOSES,

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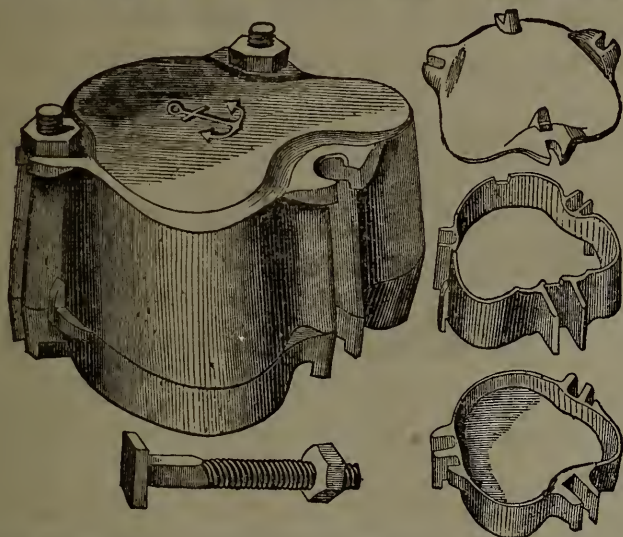
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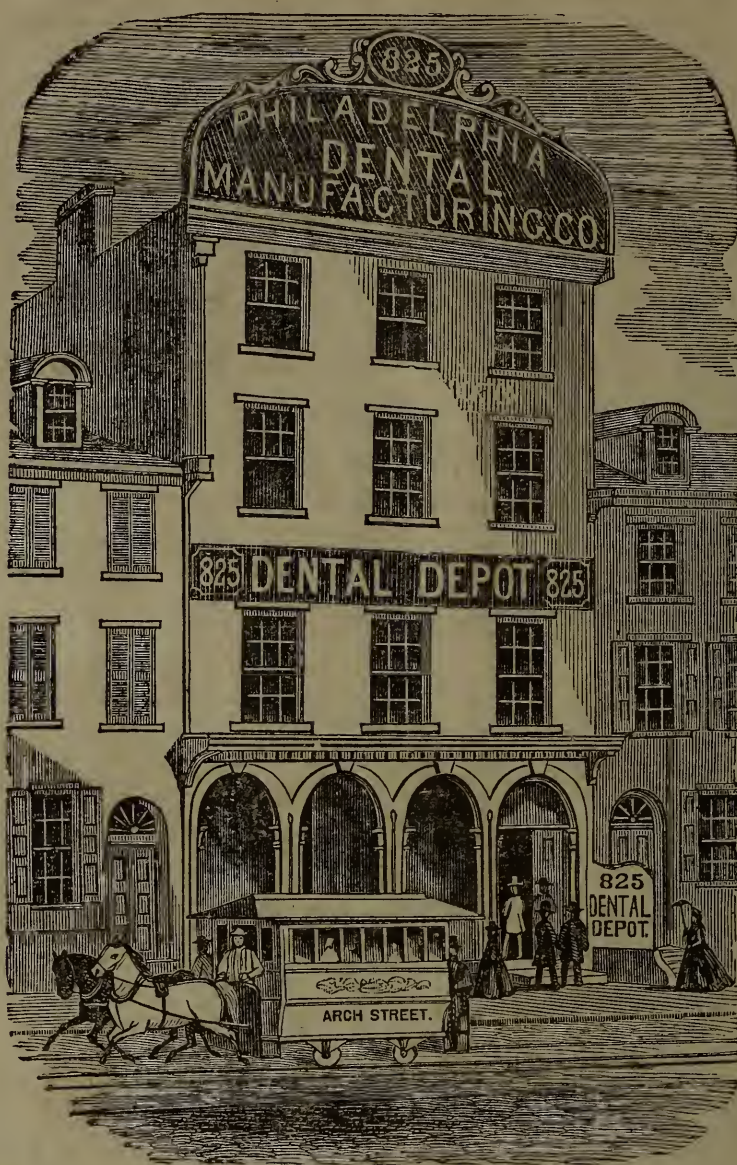


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VOL. VI.

JANUARY, 1869.

NO. 3.

THE



DENTAL TIMES,

A

QUARTERLY JOURNAL

OF

DENTAL SCIENCE.

PUBLISHED BY THE

FACULTY

OF THE

Pennsylvania College of Dental Surgery.

PHILADELPHIA.

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THE DENTAL TIMES,

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FACULTY OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.


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REQUIRES LESS MERCURY THAN OTHERS.

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And can demonstrate, beyond a shadow of a doubt,

ITS SUPERIORITY IN EVERY RESPECT TO RUBBER,

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And for lower cases,

CAN BE MADE AS HEAVY AS DESIRED.

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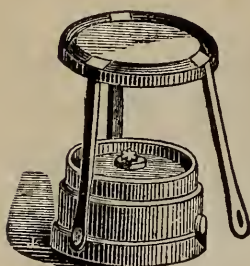
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Patented Jan. 14, 1868.

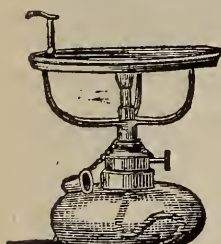


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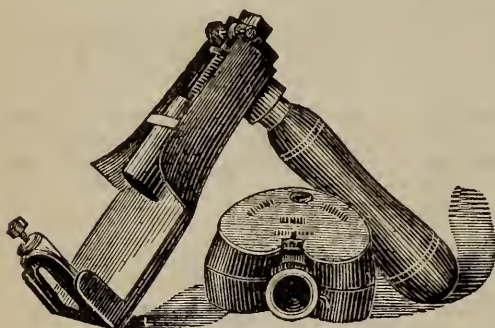
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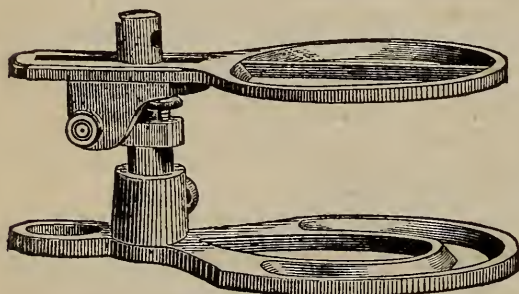
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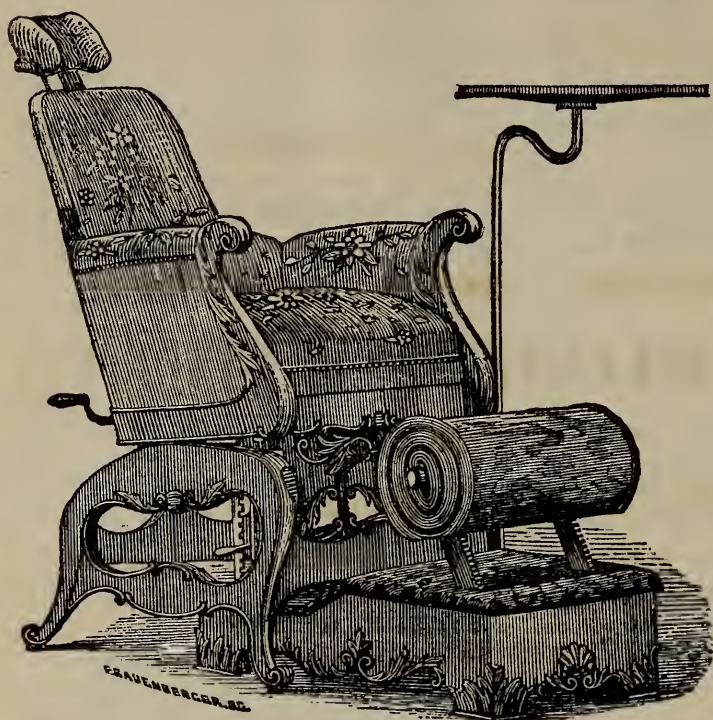
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Care of DAWSON WOODRUFF, Attorney-at-Law,

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100 North Tenth Street, Philadelphia.



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Special Notice to the Dental Profession.

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**Depot, 825 Arch Street.**

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**\$6.00 Per Pound.**

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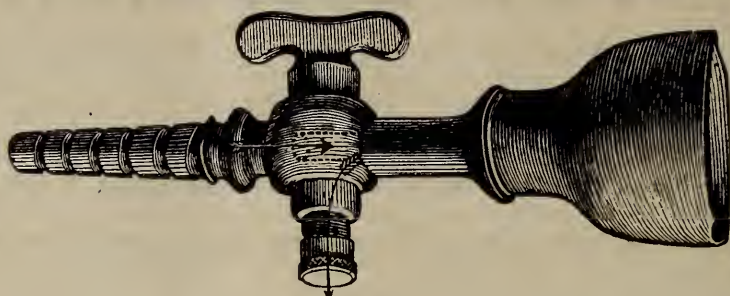
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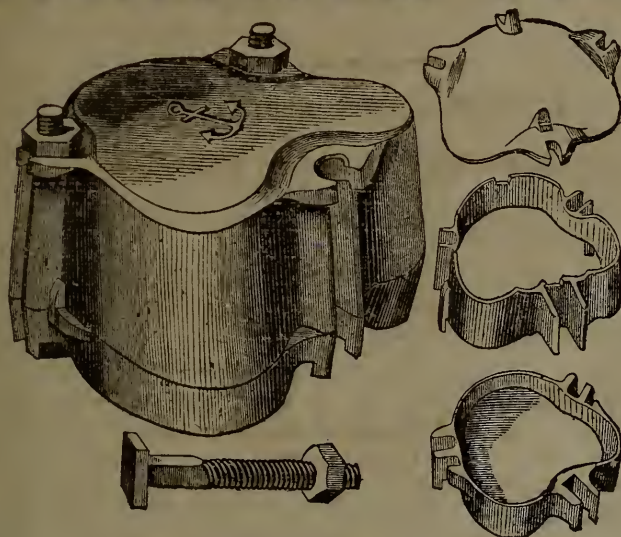
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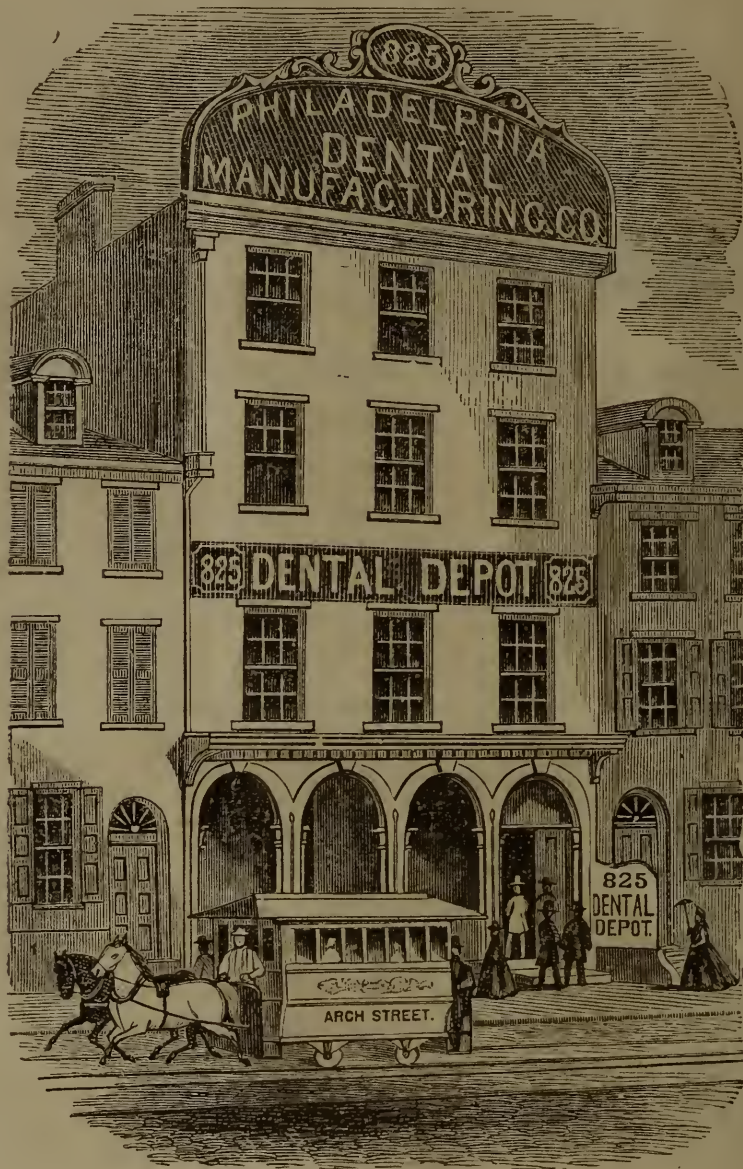


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VOL. VI.

APRIL, 1869.

NO. 4.

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THE  
DENTAL TIMES,  
A  
QUARTERLY JOURNAL  
OF  
DENTAL SCIENCE.

PUBLISHED BY THE

FACULTY

OF THE

Pennsylvania College of Dental Surgery.

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# THE DENTAL TIMES,

## A QUARTERLY JOURNAL OF DENTAL SCIENCE,

PUBLISHED BY THE

FACULTY OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.


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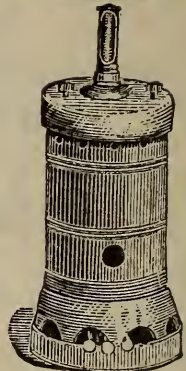
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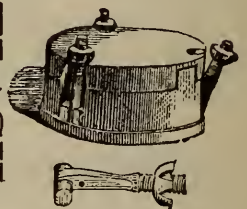
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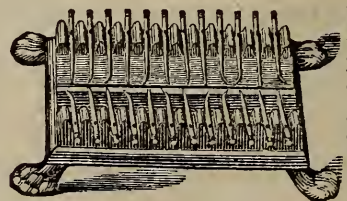
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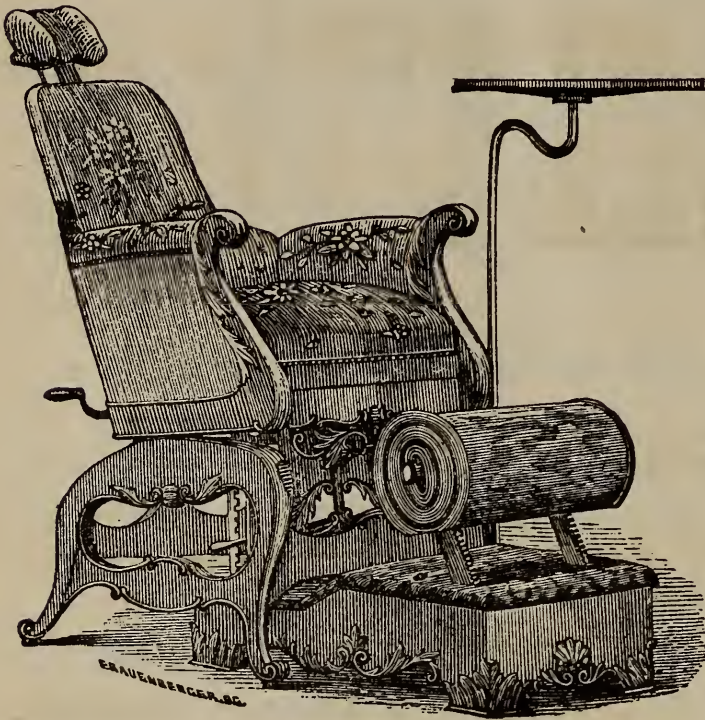
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|-------------------------|---|---|---|----|------|
| Six quart Iron Cans,    | - | - | - | \$ | 75   |
| Twelve quart Iron Cans, | - | - | - |    | 1 25 |
| Half bushel Iron Cans,  | - | - | - |    | 1 60 |
| Three peck Iron Cans,   | - | - | - |    | 2 25 |
| Eight quart Wood Pails, | - | - | - |    | 1 00 |
| Half bushel Wood Pails, | - | - | - |    | 1 60 |
| Bushel Wood Pails,      | - | - | - |    | 2 75 |
| Quarter Barrel,         | - | - | - |    | 2 00 |
| Half Barrel,            | - | - | - |    | 3 25 |
| Barrel,                 | - | - | - |    | 4 75 |

Porterage extra.

Address:

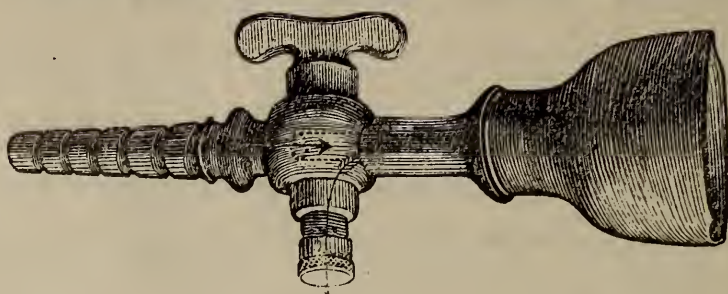
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825 ARCH STREET,

PHILADELPHIA. PA.



IMPROVED  
**DOUBLE-VALVE MOUTH-PIECE,**  
 WITH  
**DR. BARKER'S FLEXIBLE RUBBER HOOD.**



This is considered the *best arrangement for the purpose*, and its use has been ADOPTED BY THE MOST EXPERIENCED OPERATORS.

The Hood covers both mouth and nose, while one valve opens at every inhalation and the other at every exhalation.

Having a supply of these, we are now prepared to fill orders for them promptly.

LIST OF PRICES.

|                                                           |         |
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| Gas Generator, including Four Jars, Retort and Chemicals, | \$15.00 |
| Dr. Barker's Gasometer,                                   | 35.00   |
| Inhaling Bag, 7 gallons,                                  | 6.25    |
| Retorts, Tubulated,                                       | 1.00    |
| "    Plain,                                               | 75      |
| Ammonia, Fused, per lb.                                   | 65      |
| Mouth-piece, Plain,                                       | 2.00    |
| "    with Valves,                                         | 4.00    |
| "    "    and Trumpet End,                                | 4.75    |
| "    "    and Flexible Hood,                              | 5.00    |
| Trumpet end,                                              | 75      |
| Flexible Hood,                                            | 1.00    |
| Chemicals, per set,                                       | 50      |
| Glass Jars, ready for use, each,                          | 3.00    |
| Rubber Tube, $\frac{1}{4}$ inch, per foot,                | 20      |
| Rubber Hose, $\frac{5}{8}$ "    "                         | 35      |
| Condensing Chambers,                                      | 75      |
| Sand Bath,                                                | 25      |
| Gas Stove,                                                | 2.50    |
| Kerosene Oil Stove, 2 burners,                            | 3.00    |

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825 Arch Street, Philadelphia.

NEW EDITION.  
INSTRUCTIONS

IN THE

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**NITROUS OXIDE,**

**PROTOXIDE OF NITROGEN OR LAUGHING GAS,**

**FOR DENTAL AND SURGICAL PURPOSES,**

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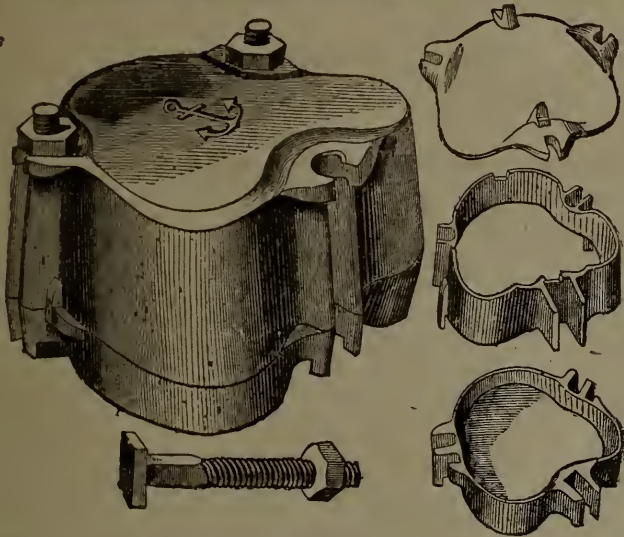
Professor of Principles of Dental Surgery and Therapeutics in the  
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**Philadelphia Dental Manufacturing Company,**

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Price, one dollar.

**THE ANCHOR FLASK.**



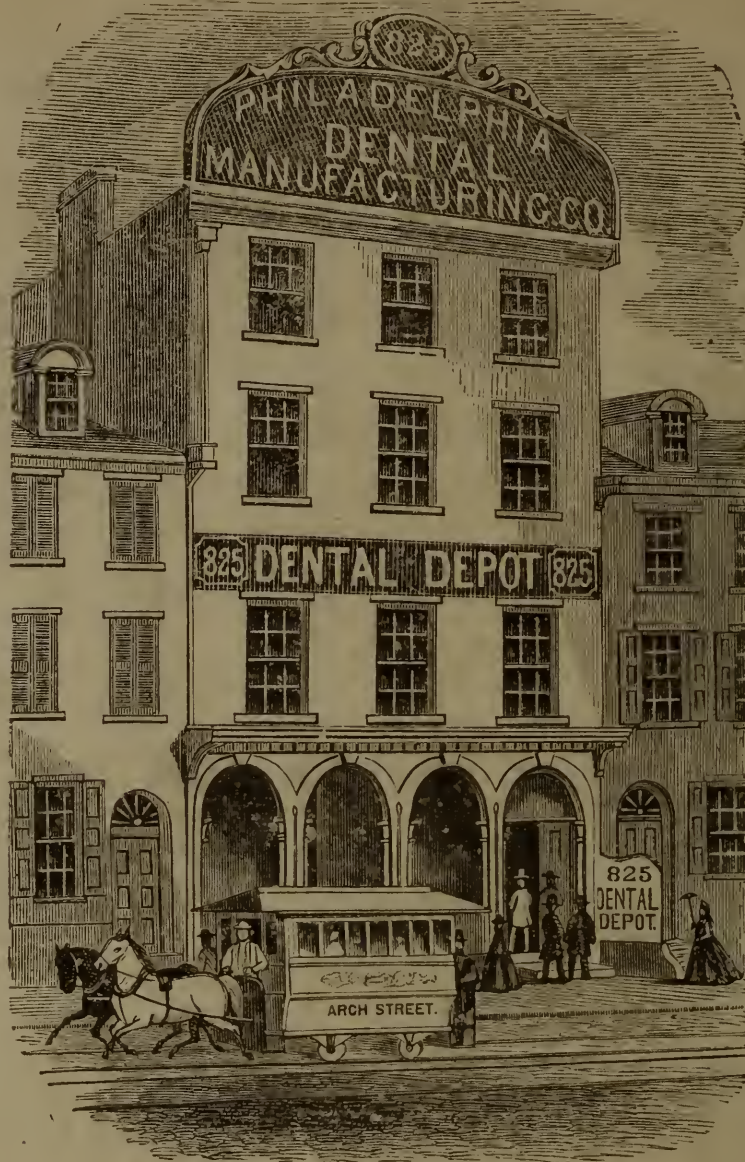
**THE LATEST! THE STRONGEST! THE BEST!**

We particularly recommend this Flask to your notice, as it has no superior, and is giving entire satisfaction in all respects.

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|----------------------|--------|
| Price, Brass,.....   | \$2 00 |
| " Iron, Tinned,..... | 1 50   |
| " " .....            | 1 25   |
| " Bolt and Nut,..... | 10     |
| " Wrench,.....       | 10     |

**PHILADELPHIA DENTAL MANUFACTURING COMPANY,**  
**No. 825 ARCH STREET,**  
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